

THE GEORGE WASHINGTON UNIVERSITY  
**SYNERGY**

SCHOOL OF  
ENGINEERING  
& APPLIED SCIENCE



Stepping Out  
of the Labs

The academic world meets the business world

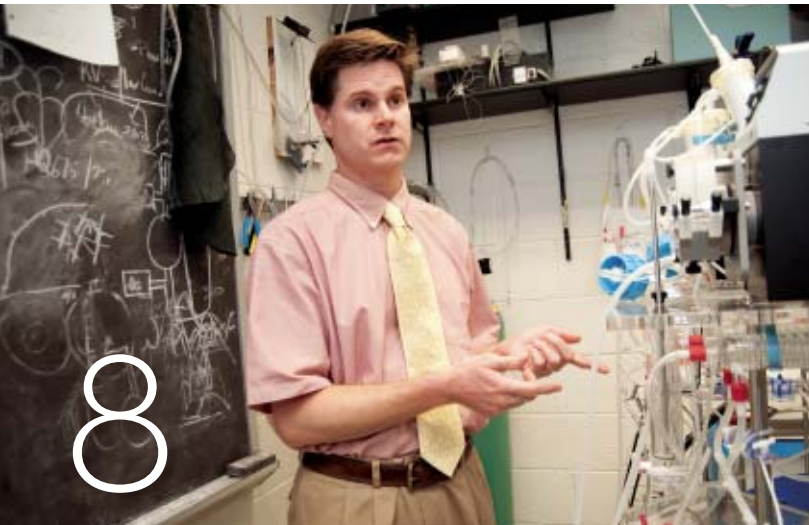


WILLIAM ADAMS/CWU

## The Site of the Future Science & Engineering Hall

In the coming year, the \$300 million, 500,000 square foot Science & Engineering Hall will begin rising out of the ground in the city block bounded by 22nd and 23rd and H and I Streets.

# Contents



## SYNERGY

FALL 2012

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7

**UPDATE:**

### Selecting SEAS

A message from Dean David S. Dolling

8

**COVER STORY:**

### Stepping Out of the Labs

The academic world meets the business world

2

**SEAS DEPARTMENTS**

12

**STUDENT PROFILE:** John Gearheart

13

**ALUMNI PROFILE:** Sassan Kimiavi &  
Gazelle Hashemian Kimiavi

14

**NEWS**

18

**FACULTY**

22

**STUDENTS**

24

**DONORS**

30

**ALUMNI**

35

**CLASS NOTES**

37

**UPCOMING EVENTS**

**PROFILE**

**Chair:** Majid T. Manzari  
202-994-4901

**www.cee.seas.gwu.edu**

**Full-time faculty:** 13

**Undergraduate students:** 129

**Graduate students:** 49

**Annual research expenditures:** \$3.9 million

**FACULTY**

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**RESEARCH AREAS****ENVIRONMENTAL ENGINEERING**

Farhadi, Riffat

**MATERIALS**

Li

**STRUCTURAL/GEOTECHNICAL/EARTHQUAKE ENGINEERING**

Badie, Manzari, Roddis, Silva

**TRANSPORTATION SAFETY ENGINEERING**

Digges, Eskandarian, Hamdar, Kan, Marzougui

## Making Predictions

The expression "Go big or go home" means to do something to the fullest—but it doesn't translate well into the materials science field, where "Go small or go home" is perhaps now more apropos.

As engineering moves further into nanoscale technologies, computational materials scientists like Professor Tianshu Li of the Department of Civil and Environmental Engineering are playing an increasingly important role in the materials science field, a field once dominated by experimentalists.

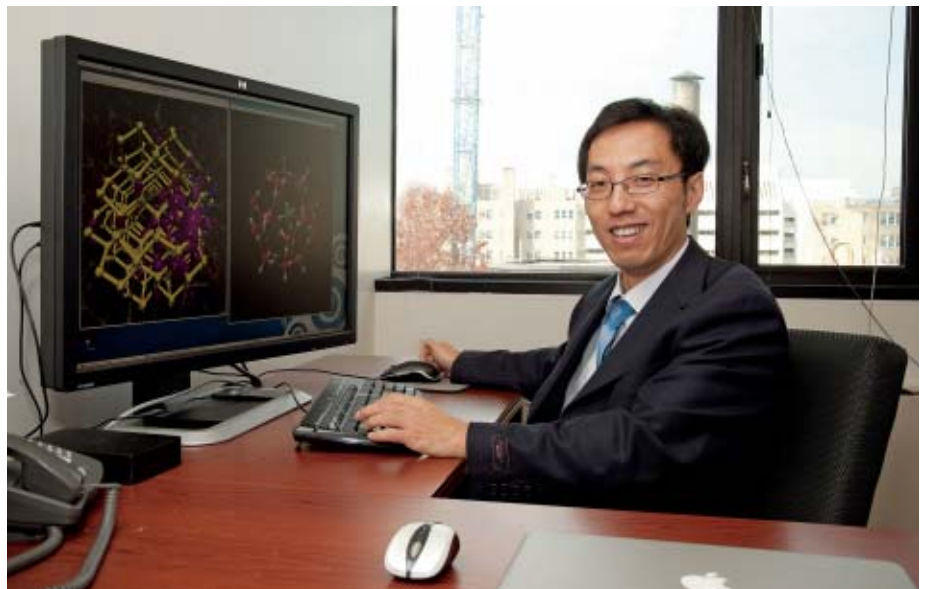
Li currently is working on simulating the formation of both ice and methane hydrates and on exploring an emerging nano material called mono-layer MoS<sub>2</sub> (molybdenum disulfide). These materials may hold great promise in the energy, environmental, and electronics fields, but their properties must first be understood.

The properties of material behavior—for example, how a given material elastically responds to an external stress—are generally dominated by the interactions among atoms. "Once we can describe this information accurately," explains Li, "we are, in principle, able to predict any kind of behavior in materials in the macroscopic world. This is the basic idea of computational materials science."

At the nanoscale, experimentalists do not have enough resolution to be able to see a material's behavior. Using computer modeling, however, Li can selectively turn on or off specific physical processes to verify their relevance. He can then share this knowledge with the experimentalists to tell them which material system to study to look for the desired material behavior. This approach saves time and money in the experimental phase.

Ice formation is one of those important processes that science would like to understand better. In the upper troposphere, ice particles grow from embryos that are only a few nanometers in size and form in a few nanoseconds. So no direct way exists to observe the embryos' formation. These ice particles form clouds in very high altitudes that absorb solar radiation and protect the earth. If the particles' formation could be better understood, perhaps through computer modeling and simulation, scientists may be better able to predict the global radiation budget and future climate change.

Methane hydrates are another important material, and Li has received an American Chemical Society Petroleum Research Fund Doctoral Investigator Award to study their formation. The methane hydrate compound occurs abundantly in nature and stores approximately twice the amount of energy found in all fossil fuels combined. Given the world's growing energy needs, great interest exists in better understanding and tapping this potentially enormous resource.





## Making Sense of Big Data

Professor Claire Monteleoni of the Department of Computer Science wants people to understand an important but often overlooked fact about algorithms: advances in algorithms are actually advances in technology. “Just as we experienced a technological advance with hardware when we were able to fit more information onto a chip, we experience technological advances, too, when we design improved algorithms,” she states.

Monteleoni conducts research in the machine learning field, a discipline that designs algorithms to analyze data. Her algorithms automatically analyze large groups of random variables and how their relationships evolve over time, and apply the information gleaned from these relationships to make predictions about a particular topic of study, such as climate science, the stock market, or medical diagnoses. The techniques are powerful and versatile.

“If you design a better algorithm, you could use either the same amount of data to get much higher accuracy of predications, or for the same accuracy in predications, you could use much smaller data sets,” Monteleoni explains. “This is really important for medical applications, where you may have a very small dataset to work with.”

On the flip side of this is what Monteleoni calls the “data deluge.” As we enter the era of “big data,” with surveillance videos and satellites generating massive amounts of data, Monteleoni advises that we will need much more scalable, fast, and efficient algorithms to analyze that data.

While Monteleoni studies the design of algorithms for machine learning more broadly, she is particularly interested in applying machine learning to climate science. In fact, she helped launch a new subfield, called climate informatics, and caught the attention of the U.N.’s Intergovernmental Panel on Climate Change (IPCC).

The IPCC has a worldwide network of laboratories, each of which uses its own climate models to make predictions on climate change. However, the laboratories’ predictions do not agree with one another, so the scientists decided a few years back to take a simple average of all the predictions.

Monteleoni had been working at the time in a subfield of machine learning that focused on combining predictions with expert advice. It was developed to track financial stocks, but she decided to apply it to climate science. “We used algorithms from machine learning to combine the predictions of 20 global climate models from these worldwide labs,” she recalls, “and our predictions were better at tracking the actual observations than the current state-of-the-art.”

Monteleoni’s use of cutting-edge machine learning techniques to accelerate discovery in climate science may be what sets her team apart from others in her field. But she credits her success to a creative approach to machine learning. “I’m working at the interface of artificial intelligence and theory of computation, so it allows for some novel insights that lead to better algorithm design,” she concludes.

### PROFILE

**Chair:** Abdou S. Youssef  
202-994-7181

**www.cs.gwu.edu**

**Full-time faculty:** 22

**Undergraduate students:** 118

**Graduate students:** 434

**Annual research expenditures:** \$1.9 million

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Simon Berkovich, **PROFESSOR**

Xiuzhen “Susan” Cheng, **ASSOCIATE PROFESSOR**

Hyeong-Ah Choi, **PROFESSOR**

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Mona Diab, **ASSOCIATE PROFESSOR**

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Rachelle S. Heller, **PROFESSOR**

Lance J. Hoffman, **DISTINGUISHED RESEARCH PROFESSOR**

**AND ACM FELLOW**

Claire Monteleoni, **ASSISTANT PROFESSOR**

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Timothy Wood, **ASSISTANT PROFESSOR**

Abdou S. Youssef, **PROFESSOR**

Nan Zhang, **ASSISTANT PROFESSOR**

### RESEARCH AREAS

#### ALGORITHMS AND THEORY

Bellaachia, Berkovich, Cheng, Choi, Wee, Youssef, Zhang

#### BIOINFORMATICS AND BIOMEDICAL COMPUTING

Bellaachia, Berkovich, Cheng, Hahn, Rotenstreich, Simha

#### COMPUTER SECURITY AND INFORMATION ASSURANCE

Cheng, Choi, Clarkson, Hoffman, Narahari, Simha, Toregas, Vora, Wee, Zhang

#### DIGITAL MEDIA

Hahn, Heller, Vora, Youssef

#### ARTIFICIAL INTELLIGENCE AND ROBOTICS

Cheng, Diab, Drumwright, Monteleoni, Sibley, Zhang

#### NETWORKING AND MOBILE COMPUTING

Cheng, Choi, Narahari, Rotenstreich, Simha

#### PERVASIVE COMPUTING AND EMBEDDED SYSTEMS

Cheng, Narahari, Simha

#### SOFTWARE ENGINEERING AND SYSTEMS

Clarkson, Narahari, Parmer, Rotenstreich, Wood

#### SEARCH AND DATA MINING

Bellaachia, Berkovich, Youssef, Zhang

**PROFILE**

**Chair:** Mona Zaghoul  
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**Full-time faculty:** 29

**Undergraduate students:** 240

**Graduate students:** 257

**Annual research expenditures:** \$2.3 million

**FACULTY**

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Amir Etemadi, **ASSISTANT PROFESSOR**

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Hermann J. Helgert, **PROFESSOR**

Howie Huang, **ASSISTANT PROFESSOR**

Matthew Kay, **ASSISTANT PROFESSOR**

Can E. Korman, **PROFESSOR**

Nicholas Kyriakopoulos, **PROFESSOR**

Tian Lan, **ASSISTANT PROFESSOR**

Roger H. Lang, **PROFESSOR AND IEEE FELLOW**

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Ergun Simsek, **ASSISTANT PROFESSOR**

Volker Sorger, **ASSISTANT PROFESSOR**

Suresh Subramaniam, **PROFESSOR**

Guru P. Venkataramani, **ASSISTANT PROFESSOR**

Branimir R. Vojcic, **PROFESSOR**

Wasył Wasyłkiwskyj, **PROFESSOR AND IEEE FELLOW**

Mona Zaghoul, **PROFESSOR AND IEEE FELLOW**

Jason M. Zara, **ASSOCIATE PROFESSOR**

Vesna Zderic, **ASSISTANT PROFESSOR**

**RESEARCH AREAS****Biomedical Engineering**

**MEDICAL IMAGING**

**MEDICAL INSTRUMENTATION**

Loew, Zara, Zderic      Kay, Li, Zara, Zderic

**Computer Engineering**

**COMPUTER ARCHITECTURE**

**AND HIGH-PERFORMANCE COMPUTING**

El-Ghazawi, Huang, Venkataramani

**MICROELECTRONICS, VLSI SYSTEMS, AND MEMS/NEMS**

Ahmadi, Korman, Li, Simsek, Sorger, Zaghoul

**Electrical Engineering**

**COMMUNICATIONS AND NETWORKS**

Doroslovacki, Helgert, Lan, Subramaniam, Vojcic

**ELECTRIC POWER AND ENERGY**

Etemadi, Harrington

**ELECTROMAGNETICS, RADIATION SYSTEMS, AND MICROWAVE ENGINEERING**

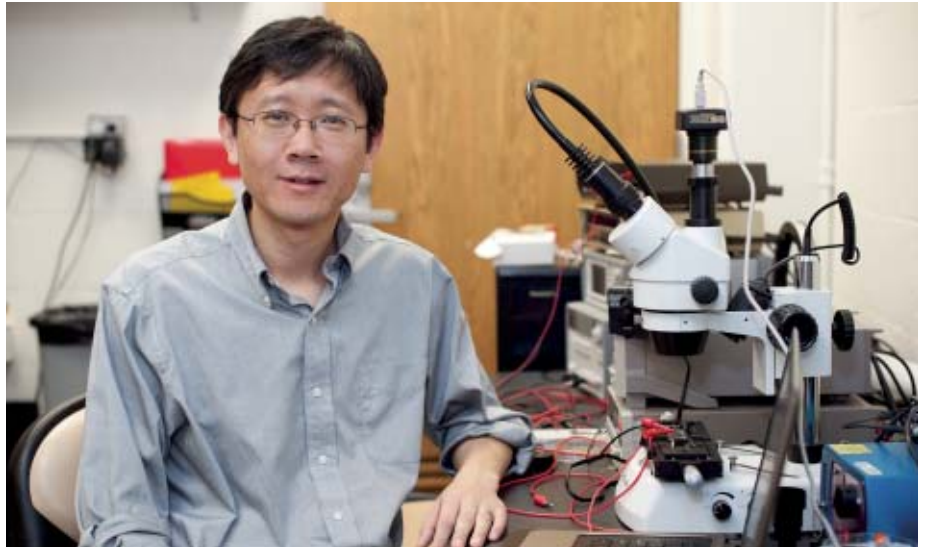
Bennett, Della Torre, Lang, Pardavi-Horvath,

Simsek, Sorger, Wasyłkiwskyj

**SIGNAL AND IMAGE PROCESSING, SYSTEMS, AND CONTROLS**

Carroll, Doroslovacki, Eom, Harrington,

Kyriakopoulos, Wasyłkiwskyj

**No Small Task**

Today's healthcare system is very reactive: only when a person feels ill does he go to the doctor. The doctor often then examines the patient, performs tests, and gives a diagnosis. Imagine a system, however, in which some of those tests would be unnecessary, because patients would have access to portable medical diagnostic devices for more timely, personalized healthcare.

Professor Zhenyu Li of the Department of Electrical and Computer Engineering is working with colleagues and students to develop technologies that will help make that scenario a reality. One of these technologies is a device called a "lab-on-a-chip" and is akin to a microelectronic computer chip. "We're using nanotechnology to try to miniaturize conventional lab equipment," says Li.

For time-sensitive diagnoses such as infectious diseases or heart attacks, such portable medical devices could change survival rates. For example, a person who is known to be at risk of having a heart attack could be given the lab-on-a-chip device, which he could use to test his blood for the presence of cardiac Troponin I, a highly specific biomarker whose concentration in blood shoots up dramatically when the heart muscle is damaged. If the biomarker is detected, he could seek treatment immediately, rather than having to send a blood sample to a lab and wait for results.

In spite of the pun, miniaturizing conventional lab equipment is no small task. Li explains, "With a computer chip, you are handling only electrical signals, but for medical diagnostics you have to handle biological samples, like blood or saliva, and you also need to add sensor components to the chip. It really requires a lot of expertise from different fields to make a complete system."

For a lab-on-a-chip to be effective, the body fluid sample must be able to get close enough to the sensor, and this means that the electronics and sensing components must be integrated into the microfluidics device, the device that handles small volumes of body fluids. However, traditional microcomputer chips are made of a very rigid silicon substrate and require special packaging processes, which make integrating them with fluidics very difficult.

While other researchers are also working on lab-on-a-chip technologies, very few are trying to integrate all three components—microfluidics, optical sensors, and electronics—into a complete system in order to solve this problem. Working with Professors Mona Zaghoul and Can Korman, Li and his team recently found a way to do this by developing a technique that enables them to embed the microelectronics chip in the same microfluidics device. Their technique creates small channels in the substrate through which they introduce liquid metal in the same way they introduce fluid samples. The metal makes liquid-based electrical connections to the microelectronic chip, which enable the body fluid sample to get closer to the sensor. In addition, the device is very soft and can be made on a flexible surface that can be wrapped around a finger.

This is an accomplishment of which Li is justifiably proud. "I don't think any other group has integrated the three things—fluidics, optics, and electronics—all in one microsystem," he claims. "This is a true breakthrough."

## It's Just Good Policy

Professor Royce Francis of the Department of Engineering Management and Systems Engineering studies problems that lie at the intersection of civil infrastructure systems and public policy. One of those problems, the aging U.S. drinking water infrastructure, presents a particularly interesting research puzzle for him at present.

A rapidly growing proportion of the nation's drinking water infrastructure is more than 50 years old, and the problems associated with it—such as pipe breaks and consequent water loss—are growing, too. According to Francis, these problems are increasing, which challenges our ability to study them and develop cost-effective innovations to upgrade or rehabilitate the water distribution system.

"If you want to optimize your replacement activities in the long run or if you have very limited resources and you want to make sure that you're making the right investment, then you want to have a deeper understanding of why pipes are breaking," says Francis.

Although the research community has made a good deal of progress during the last decade in developing statistical models of pipe breaks, most models still have poor prediction accuracy. Almost all current models include five standard factors: pipe age, break history, the length of the particular pipe segment, the pipe material, and its diameter. Only a few studies have gone beyond this to consider the soil type around the pipe, the moisture content of the soil around the pipe, weather-related variables, and other factors.

Francis is developing models that consider these additional factors, and he is using a variety of data mining techniques to do so, including Bayesian networks and random forests. About his favorite technique he says, "I don't think I've seen a researcher yet who uses Bayesian networks to try to predict pipe breaks."

Bayesian networks are graphical models, not equations, and Francis believes that they provide a key advantage to support a policy maker's decision making process. He explains, "Networks may engage a decision maker more than an equation does. They can allow people to understand the relationships among the variables more easily than do basic linear models, because in our minds, the way that we think looks more like a map than a line."

Francis makes a strong case for a Bayesian network approach to understanding and rehabilitating our water infrastructure system: the better one understands the problem he is trying to address, the more likely it is that the chosen remedies will be effective. In a time of fierce budget and spending debates, models that better diagnose and predict the causes of the pipe breaks and better explain them to policy makers just seem like, well, good policy.



### PROFILE

**Chair:** Thomas A. Mazzuchi  
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**www.emse.seas.gwu.edu**

**Full-time faculty:** 15

**Undergraduate students:** 57

**Graduate students:** 1,117

**Annual research expenditures:** \$4.3 million

### FACULTY

Hernan G. Abeledo, **ASSOCIATE PROFESSOR**

Joseph A. Barbera, **ASSOCIATE PROFESSOR**

Jonathan P. Deason, **PROFESSOR**

Michael R. Duffey, **ASSOCIATE PROFESSOR**

Howard Eisner, **DISTINGUISHED RESEARCH PROFESSOR,**

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Royce Francis, **ASSISTANT PROFESSOR**

Erica Gralla, **ASSISTANT PROFESSOR**

Thomas A. Mazzuchi, **PROFESSOR**

E. Lile Murphree, **PROFESSOR**

Julie J. C. H. Ryan, **ASSOCIATE PROFESSOR**

Joost Reyes Santos, **ASSISTANT PROFESSOR**

Shahram Sarkani, **PROFESSOR**

Gregory L. Shaw, **ASSOCIATE PROFESSOR**

Zoe Szajnarfarber, **ASSISTANT PROFESSOR**

J. Rene van Dorp, **PROFESSOR**

### RESEARCH AREAS

**CRISIS, EMERGENCY AND RISK MANAGEMENT**

Barbera, Gralla, Mazzuchi, Santos, Sarkani, Shaw, van Dorp

**ECONOMICS, FINANCE AND COST ENGINEERING**

Duffey, Santos, van Dorp

**ENGINEERING AND TECHNOLOGY MANAGEMENT**

Deason, Duffey, Eisner, Murphree, Shaw, Szajnarfarber

**ENVIRONMENTAL AND ENERGY MANAGEMENT**

Deason, Francis

**KNOWLEDGE AND INFORMATION MANAGEMENT**

Ryan

**OPERATIONS RESEARCH**

Abeledo, Gralla, Mazzuchi, van Dorp

**SYSTEMS ENGINEERING**

Duffey, Eisner, Gralla, Mazzuchi, Ryan, Santos, Sarkani, Szajnarfarber, van Dorp

**PROFILE**

**Chair:** Michael W. Plesniak  
202-994-9803

**www.mae.seas.gwu.edu**

**Full-time faculty:** 23

**Undergraduate students:** 158

**Graduate students:** 101

**Annual research expenditures:** \$1.5 million

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Pinhas Ben-Tzvi, **ASSISTANT PROFESSOR**

Ken P. Chong, **RESEARCH PROFESSOR**

Andrew D. Cutler, **PROFESSOR**

David S. Dolling, **PROFESSOR, AIAA AND ROYAL AERONAUTICAL SOCIETY (UK) FELLOW**

Morton H. Friedman, **RESEARCH PROFESSOR**

Charles A. Garris, **PROFESSOR AND ASME FELLOW**

Stephen M. Hsu, **PROFESSOR AND ASME FELLOW**

Michael Keidar, **ASSOCIATE PROFESSOR**

James D. Lee, **PROFESSOR AND ASME FELLOW**

Taeyoung Lee, **ASSISTANT PROFESSOR**

Megan C. Leftwich, **ASSISTANT PROFESSOR**

Yongsheng Leng, **ASSOCIATE PROFESSOR**

Chunlei Liang, **ASSISTANT PROFESSOR**

Michael W. Plesniak, **PROFESSOR AND ASME, AAAS, AND APS FELLOW**

Kausik Sarkar, **ASSOCIATE PROFESSOR**

Alex Shashurin, **RESEARCH SCIENTIST**

Yin-Lin Shen, **PROFESSOR**

Jonathan Silver, **RESEARCH PROFESSOR**

Murray R. Snyder, **RESEARCH PROFESSOR**

Adam M. Wickenheiser, **ASSISTANT PROFESSOR**

Lijie "Grace" Zhang, **ASSISTANT PROFESSOR**

**RESEARCH AREAS****AEROSPACE ENGINEERING**

Cutler, Dolling, Garris, Keidar, T. Lee, Plesniak, Wickenheiser

**BIOMEDICAL ENGINEERING**

Balaras, Ben-Tzvi, Friedman, Keidar, J. Lee, Leftwich, Liang, Plesniak, Sarkar, Silver, Zhang

**DESIGN AND MANUFACTURING OF MECHANICAL AND AEROSPACE SYSTEMS**

Ben-Tzvi, Garris, Leng, Shen

**FLUID MECHANICS, THERMAL SCIENCE, AND ENERGY**

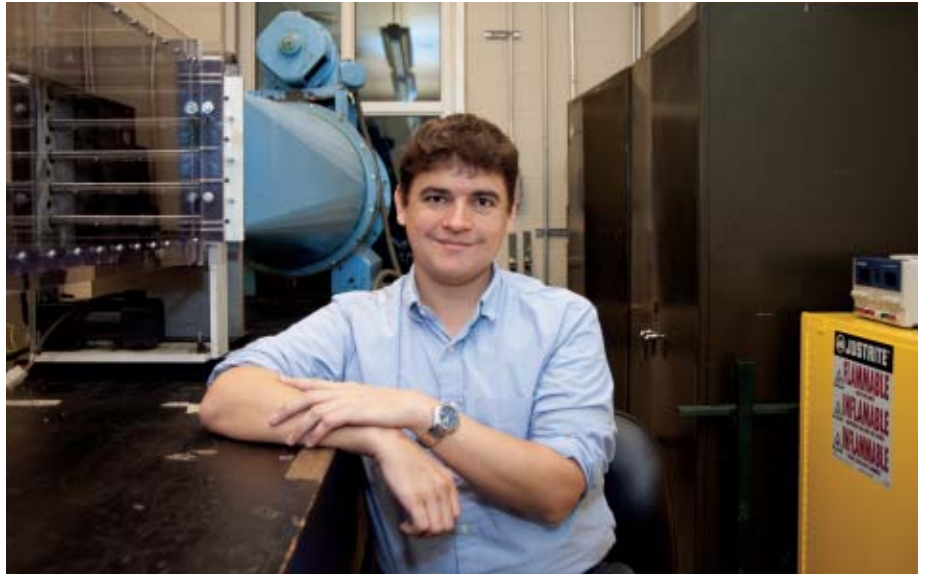
Balaras, Bardet, Cutler, Dolling, Garris, Hsu, Keidar, Leftwich, Liang, Plesniak, Sarkar, Snyder, Wickenheiser

**SOLID MECHANICS AND MATERIALS SCIENCE**

Chong, Hsu, J. Lee, Leng, Zhang

**MECHATRONICS, ROBOTICS, AND CONTROLS**

Ben-Tzvi, J. Lee, T. Lee, Wickenheiser

**Get Smart**

"Much of my research involves the use of smart materials in different ways," says Professor Adam Wickenheiser of the Department of Mechanical and Aerospace Engineering. In fact, Wickenheiser began working with smart materials because he thinks they are the key to miniaturizing sensing and actuation technology.

Smart materials are multifunctional: they can be used both structurally, like concrete or steel, and for a secondary purpose, such as producing an electromagnetic signal or heat flux. Because they can perform two functions at once, they enable researchers like Wickenheiser to design small scale technologies that would not be possible with discrete components.

Wickenheiser's primary research project uses smart materials to develop sensors and actuators for bird-scale aircraft, which are one- to two-foot, unmanned aircraft that may one day be used for monitoring or surveillance missions close to the ground or within cities. One of Wickenheiser's big challenges is to design a wing that can respond effectively to turbulence and gusting, because as aircraft become smaller, the influence of wind disturbance becomes relatively larger.

To meet this challenge, he is looking for clues from bird wings. "If a large gust of wind hits a bird, its wings have a certain amount of passive flexibility, and the feathers deflect in response, without the bird really making a conscious decision," says Wickenheiser. "We're trying to build a closed loop feedback system into the model wing itself, so it can detect a disturbance and then respond more automatically, like a bird's wing."

Wickenheiser believes that his background gives him a somewhat unique advantage in trying to solve this problem. "Because I have a background in smart materials and fluid mechanics *and* control systems, I'm looking at this from a multi-physics perspective. I'm looking at the fluids and the structure and electrical circuit together to see how they combine to give an efficient design," he remarks.

So far, he and his team have developed a model of a wing section with feather panels and have run a multi-physics simulation of it passing through turbulence. After validating the simulations, they will compare their results with experimental results from a model they will test in a wind tunnel. The feedback mechanism on the system they are creating is designed such that the wing panel can monitor itself in real time and adjust its response to the changes in turbulence set by the team.

In Wickenheiser's view, this ability is a game-changer. "The reason we're going through all of this is that simulations can't be done in real time," he says. "A single simulation can take hours or days depending on its complexity. But we've outfitted our system with enough sensing and feedback capability that it basically will be able to monitor itself and learn from what it's doing. Once we have that in place, I think that the speed at which we'll be able to develop new results is going to be light years ahead of what we're able to do in simulation." He adds, "And as far as I know no one else is doing anything as extensive as this using active wings."



## Selecting SEAS

As *Synergy* magazine goes to press, I am about three months into my fifth year as dean of the School of Engineering and Applied Science. I came to SEAS after 25 years in Texas, where I learned many colorful sayings, one of which is, "It ain't braggin' if it's true." So it is far from bragging to point out a few of the many signs of our remarkable progress over the past four years.

A key enabler of our progress is something that is now well underway, but yet to be completed: the Science and Engineering Hall (SEH), our \$300 million, 500,000 square foot building now rising out of the ground. In just a little over two years from now, we will move in.

The growing reality of the SEH has undoubtedly been a key element in attracting the outstanding faculty we have recruited in the past several years. We know that because they tell us that. Over the past four years, 37 new faculty have joined SEAS from top ranked engineering programs here in the U.S. and internationally. They are winning prestigious national research grants, commercializing the technologies coming out of their labs, and winning national prizes. For details of some of these successes, take a look at the article on technology commercialization on the next page and the major research grants article on page 20. Or, consider this one fact that sums up their research accomplishments: our research expenditures in the first quarter of the current fiscal year were up about 40% over the same quarter of last year.

Applications and enrollments for our undergraduate, master's, and doctoral programs are also up. In fact, they're at record levels, as is our ability to be highly selective. This is no coincidence, but instead the result of a growing reputation based on solid accomplishments and the promise of the SEH—and what all of this means in terms of what we can offer our students. As families and students visit and explore campuses across the U.S. and assess their options, they are finding the opportunity to learn in the SEH hard to turn down. Smart people can smell where success is possible, and they are selecting SEAS.

The SEH is more than a building, though. Besides the direct benefits of helping us attract some of the best faculty and students, it stands as a symbol of the sea-change at GW with respect to its commitment to engineering and the sciences, and to the understanding that in the 21st century no university can be a national and international leader in research without strong programs in these fields. This commitment to the SEH, the largest and most expensive commitment that GW has ever made, sends a powerful message to our stakeholders, who are stepping forward and helping us with their ideas, their time, their energy, their connections, and their resources. They want to "be a part of it."

In the past four years alone, contributions from our alumni and supporters have enabled us to double the SEAS endowment. Our endowment is vital to us. Income from it supports endowed professorships, scholarships, and fellowships. It also supports student activities, from participation in national design competitions and conferences to helping with study abroad expenses. But our ambitions are large. To meet the needs of growing programs we need to double that again in four years, and double it again, if we are to have the resources to drive our vision to conclusion, and maintain it.

These four years have been busy and productive ones, exciting ones, with tangible results. If you have already become "a part of it" here at SEAS, I thank you and ask you to stay engaged. If you have been on the sidelines, observing and wondering when to jump in, then I encourage you to jump in now. We welcome you. It is your time, your ideas, your energy, your resources—small or large—that will allow us to achieve the vision. We cannot do it without you.

DS Dolling



Dean David S. Dolling



## THE ACADEMIC WORLD MEETS THE BUSINESS WORLD

**A** new data analytics system that aims to provide aggregate views of the worldwide web. A process to strengthen commercial plastics used in airplanes and automobiles thereby improving passenger safety. A new technology to better treat a type of irregular heartbeat that can, in some cases, lead to a stroke.

The story of these three technologies being developed by School of Engineering and Applied Science (SEAS) faculty and their research teams is not simply a story of technological breakthroughs. It's more a story of the academic research world meeting the business world. In fact, it's the story of engineering and computer science faculty who are breaking out of their research roles a bit, stepping out of the labs, and actively seeking out potential investors and customers to commercialize their technologies.

This is becoming more common as research universities across the U.S. move to set up programs and support services to facilitate

partnerships between their faculty and investors. And as they do so, they are being nudged and encouraged by research sponsors like the National Science Foundation and others, who also are eager to move promising research from the labs to the markets.

GW and SEAS also are promoting this approach. In fact, the school has more recently begun to show "a real knack for building connections with potential customers and investors to develop and commercialize the technologies we've conceived," says David Dolling, dean of the school.

"With the encouragement of the school's National Advisory Council, we're creating a culture here at SEAS that thinks of commercialization as a complement to scholarly pursuits. We're working to identify ways to accelerate moving research from the lab to the market, and we're doing this in a way that's aligned with national priorities," Dolling says.

## Biomedical engineering: improving treatment of atrial fibrillation

Allied Minds is an investment firm that provides start-up funds to form companies for early-stage technologies developed at U.S. universities and federal research institutions. The firm recently announced that it has committed \$500,000 to create LuxCath, LLC, a subsidiary that will further develop a real-time, tissue and lesion visualization technology created in the labs of SEAS Professor Matthew Kay and his colleagues in the School of Medicine and Health Sciences and the GW Medical Faculty Associates.

Professor Kay, a member of the Department of Electrical and Computer Engineering faculty; Marco Mercader, MD; and cardiac physiologist Narine Sarvazyan, Ph.D. are co-creators of the technology. The three were studying a particular way of imaging the heart, and in the process, they discovered that they could build a catheter that physicians can use in

real time to improve radio frequency ablation, a treatment for atrial fibrillation.

Atrial fibrillation is a commonly occurring cardiac arrhythmia or irregular heartbeat, particularly in older people. "It's not deadly, but treating it is important because there can be discomfort and it can cause rapid heart rates that can be dangerous," says Kay. He also explains that atrial fibrillation can lead to the formation of blood clots that may be pumped into major organs, such as the lungs or the brain, and cause strokes.

The first treatment option for atrial fibrillation is typically a prescription drug, but if the drug doesn't stop the arrhythmia, then patients usually receive ablation therapy. Radio frequency ablation therapy uses a catheter that is inserted into the heart and heated to kill the tissue that is causing the arrhythmia. Because damaged tissue is not electrically conductive, the physician can also isolate or wall off sources of the arrhythmia if he can effectively encircle it with a series of contiguous burns.

"What's important about isolating the source of the arrhythmia is that there can be no gaps between individual burns," explains Kay. "They all have to touch each other; otherwise, aberrant electrical activity can break through the wall and keep the arrhythmia going."

Kay says that physicians are using the technique without ever seeing the tissue they are ablating. "They time the burns and move over a bit each time, watching how the electrical signals change on the monitor until they think they have stopped the arrhythmia." However, sometimes the overlaps are not complete and the tissue between them is only stunned by the burn, not killed. When this happens, the tissue can recover after a couple of weeks and become electrically active again. According to Kay, many patients typically have to have the procedure repeated two to three times before the atrial fibrillation is gone for good.

This is where the real-time, tissue and lesion visualization technology that he and Drs. Mercader and Sarvazyan created comes in. "We've developed a way to look at the burns using light," says Kay. "The technique is to look at these lesions in a new way that will reveal with high contrast any tissue gaps that were left by the treatment, so the physician can take care of gaps during the first treatment, eliminating the need for the patient to return for re-treatment. We've found that we can build a catheter that physicians can use in real time to show when they've missed a spot."

The next step for the team of researchers is to continue testing and developing the technology. "There will be multiple revisions of the prototype," says Kay, "but I feel very excited about what we're doing in the lab. Ideas we have in the lab are sometimes so far removed from the clinic that it's hard to see how we might be able to make the jump to getting the technology into the clinic. With this idea, I can see how that jump can be made, and having Allied Minds behind us gives us a lot of momentum to successfully make that jump."

"We're creating a culture here at SEAS that thinks of commercialization as a complement to scholarly pursuits."

Left to right: Dr. Narine Sarvazyan (SMHS), SEAS Professor Matthew Kay, and Dr. Marco Mercader (GW Medical Faculty Associates)





Left to right: Professor Michael Keidar, SEAS alumnus Randy Graves, and SEAS research scientist Alex Shashurin

### Nanotechnologies: using graphene to strengthen plastics

Meanwhile, in the Department of Mechanical and Aerospace Engineering, Professor Michael Keidar and research scientist Alex Shashurin have been developing a number of uses for plasmas. Keidar and Shashurin recently discovered a way to synthesize graphene using plasmas.

Graphene is a 2D substance of pure carbon. Its atoms are arranged in a pattern that is similar to graphite, but graphene is a one-atom thick sheet—thus the 2D structure. One of the biggest potential uses of graphene would be in reinforcing industrial plastics, such as those used in cars, trucks, and airplanes.

The current method for synthesizing graphene uses chemical processes, but the plasma-based method Keidar and Shashurin have discovered is less expensive than the chemically based method, has no chemical by-products, and exerts more control over the graphene properties. Keidar and Shashurin believe that the automobile and airline industries would be very interested in their technology because, once it is developed, it would create an economically viable method for reinforcing plastics.

But Keidar and Shashurin are engineers; what do they know about markets and potential customers for their technology? Maybe not much, at first. But as it turns out, they are learning quickly. Jim Chung, the director of GW's Office of Entrepreneurship, contacted Keidar in March and convinced him to compete for a slot in the National Science Foundation's (NSF) Innovation Corps program (I-Corps) last summer to learn how to commercialize their technology.

After Chung introduced Keidar and Shashurin to the I-Corps program, he introduced them to Randy Graves, a SEAS alumnus and entrepreneur, who agreed to be their entrepreneurship mentor. The three formed a team, submitted a proposal for the program, and were awarded one of the 28 slots from among 275 team applications.

The purpose of the I-Corps program is to teach university researchers to evaluate the commercial potential of a technology they are developing. "It was so different from what we're doing in the labs," says Shashurin, the entrepreneurial lead for the team. "We didn't have much of an idea of the process of taking an idea from discovery to the market. You need to understand what your value proposition is; who your customers are

"We made the firm conclusion that this is a viable technology and it makes sense to continue."

and what benefit your product delivers to them; how to segment the market; what distribution channels you plan to use; and what your revenue model is and your cost structure. They taught us all these elements."

The seven-week program began with an intense, three-day workshop at the University of Michigan, followed by six, weekly online video conference calls. During the three-hour calls, the teams received feedback on what they had accomplished from the previous week. At the end of the program, the teams returned to the University of Michigan for their final presentations.

Throughout the program, the focus was on talking to potential customers to get their feedback. "We talked to 86 customers in six weeks," recalls Graves. "The purpose was to make sure that university researchers really understand what companies want and to find out what they, the researchers, need to know to make sure their technology gets into the marketplace. In a couple of cases, the teams ended up dramatically changing their focus as a result of those interviews."

As for the GW Graphene Team, "we made the firm conclusion that this is a viable technology and it makes sense to continue," says Keidar. "And we'll continue building the business platform for that."

The team recently applied for the follow-on NSF program, Partnership for Innovation (PFI), and is waiting to hear whether it has been accepted. Through PFI, they will continue working out potential problems with the technology and will build relationships with possible collaborators and investors. They are also exploring other avenues, including working through the GWERT [George Washington University Entrepreneurs Round Table] Mentors program, which is run through the Office of Entrepreneurship. "[Michael and Alex] will now have four GWERT mentors who will help them, because they're now ready for this stage," explains Graves. "They wouldn't have been ready without the I-Corps process."

## Computing: deep web mining to enhance data analysis

A little farther along in the commercialization process is Professor Nan Zhang of the Department of Computer Science and his graduate student, Zhoujie Zhou. Zhang participated in the first I-Corps cohort during the fall of 2011 to refine the development of DeepWebWatch, a data analytics system created at GW.

DeepWebWatch works to make sense of the vast information contained in databases on the web. Zhang explains the technology by invoking the image of an iceberg. If one envisions the Internet as an iceberg, Google and Yahoo! are able to uncover information only at the very tip. DeepWebWatch, on the other hand, is able to go below the surface and draw valuable and analytical information from data repositories hidden within the “deep web.” The deep web refers to huge databases hidden behind restrictive web search interfaces, such as Amazon or eBay.

“Unlike traditional search engines, which retrieve individual documents from the web, DeepWebWatch aims to provide big-picture, aggregate views of the entire web sphere,” says Zhang. “In other words, the goal of DeepWebWatch is not to find a needle in the haystack, but to measure the entire haystack as a whole.”

He continues, “DeepWebWatch helps with the understanding of how much, and what types of, aggregate information can be inferred from deep web data sources such as e-commerce websites (e.g., Yahoo! Autos, Amazon.com), so the data owners can make an informed decision of what to and what not to disclose through their websites.”

After learning in the I-Corps program about how to mitigate the gap—“they call it the ‘Valley of Death,’” says Zhang—between research that has been done in the lab and something that actually addresses a real world business need, Zhang and Zhou entered DeepWebWatch (then called WiseAgg) in the 2012 GW Business Plan Competition last spring.

From the initial pool of 144 entries, Zhang and Zhou were selected as one of eight team finalists to present their product to a panel of investors, venture capitalists,

alumni, and entrepreneurs. They took home top honors for their “Google for analysts” business pitch, receiving \$25,000 in cash, in-kind investments, and the competition’s Plug and Play Tech Award, which covered travel and tuition expenses for a “start-up accelerator” seminar in Silicon Valley.

Zhang and Zhou are working with GW’s Office of Technology Transfer on opportunities to further develop their analytics system, and their product and customer development efforts continue, long after the end of the I-Corps boot camp and the GW Business Plan Competition. “We pivoted basically every few weeks or months based on what we heard from these potential customers and we are still pivoting to new directions right

now,” explains Zhang. “The neat thing about the technology is that it has a very broad spectrum of potential applications. This gives you opportunities, but it also gives you problems in finding the one that really works. It’s something that evolves constantly.”

“We pivoted...every few weeks or months based on what we heard from these potential customers and we are still pivoting to new directions right now.”

Left to right: Professor Nan Zhang and SEAS graduate student Zhoujie Zhou



# John Gearheart

## The **MOTIVATING FACTOR**

**N**ever underestimate the power of motivation. John Gearheart doesn't. In fact, as he tells the story, both positive *and* negative motivation played a role in his decision to enter last year's national Intel Innovators competition.

John, a senior majoring in biomedical engineering, is a very good student and a hard worker, but like all students, he needs a break from his studies every now and then. So during finals week of his fall semester last year, he decided to procrastinate a bit and check his Facebook page. "I was on Facebook and saw the Intel competition page to encourage 18- to 25-year-olds to send ideas for projects to them. I'd been putting off a lab and decided to focus my efforts on this competition. I thought it would be a good experience toward developing my idea," John recalls.

As it turns out, it was a good idea: John won second place out of 400 entries. His idea, called "Ctrl+F Kitchen," is a system that creates an automatic inventory of a user's kitchen. It tracks the groceries in his kitchen and when they are set to expire, populates his grocery list, and even searches recipes to help him determine what he can make with the items he has on hand.

John's motivation for this was personal. "When I'm at home it's my job to get on my hands and knees to search for the hard-to-find things in the house, because I'm the youngest." And, he adds, "My kitchen is where I spend most of my time; I do love to cook."

At the time of the Intel competition, John was taking a circuit signals systems course and had learned about RF (radio frequency) technologies, so he did what enterprising engineers do: "I went back to my apartment and tried to think of ways to use it to make my life easier," he says matter-of-factly.

The system he created is made of three parts: an RFID (radio frequency identification) tag, which is a small circuit that passively sends information that is programmed into



it; an RFID reader in the form of a flat mat circuit that senses the information and transmits it to a computer; and the software to analyze the transmitted data and create the inventory. "Soon, RFID tags will be cheaper than barcodes, and Walmart has already installed them in over half of their goods," John explains.

He credits Professor Shahrokh Ahmadi and the SEAS capstone senior design process with assisting him in the project. "Dr. Ahmadi helped me draft the antenna and the RFID reader and sensor and the coupling of the two, and the capstone design helped me with the entrepreneurial presentation aspect," he notes—adding, "I'm excited about the shift to making engineering more entrepreneurial here on campus. I think it's really important."

Innovation and entrepreneurship aren't John's only interest, however. He also enjoys music and is a talented singer. "My mom was an opera singer in Italy, and during the summers in high school, I worked at the opera school she runs in Italy."

When it was time for him to apply to colleges, music factored into his decision. He knew

that he wanted to go to college in a city and was looking for a school that offered both engineering and music. He entered a GW music competition for non-music majors, and after winning it and the Presidential Scholar in the Arts scholarship for voice, he decided to study at GW.

He has been busy ever since. On top of his classes, he has worked as an undergraduate researcher in Professor Jason Zara's optical coherence tomography lab and has served as the director of GW's Sons of Pitch *a capella* group, the president of the SEAS-SPAN mentoring program, and the academic chair of Theta Tau professional engineering fraternity. He is also a member of Tau Beta Pi, the engineering honor society.

His various activities and experiences undoubtedly have provided valuable lessons for him, but the Intel Innovators competition seems to stand out. "I learned that small ideas are worth developing and that there's a world of people out there who are interested in your ideas and can help you develop them," John concludes. "It's not too far a leap from the courses you're taking to be able to implement these ideas."

## Sassan Kimiavi & Gazelle Hashemian Kimiavi

The Power of **TWO**



**W**hen I came to this country from Iran at the age of 14, I was with a bunch of kids and the oldest was a freshman at GW,” recalls Sassan Kimiavi. “He’s the one who got our I-20s so we could come to the U.S. to go to high school. So when I applied to colleges, I wanted to get into GW because I really looked up to this older kid who got us into this country, and he was at GW.”

Sassan decided to study mechanical engineering at SEAS and then stayed for a master’s in computer science, and ultimately a doctorate, as well. After he finished his master’s degree, he and Gazelle Hashemian, whom he had met years earlier at her sister’s wedding, married and started their life together. Gazelle soon completed her bachelor’s degree in electrical engineering at George Mason University, and when she decided to continue on for a master’s degree in telecommunications, she, too, chose to study at SEAS. “I selected GW because Sassan had a very good experience there and I wanted to go to a private school. And, the location was convenient,” she says.

Both Sassan and Gazelle began their careers in the IT sector, working for various companies in the Washington, D.C. area. Sassan had been thinking of starting his own company, and in 1997, he found his opportunity. While working as a director of a local company that provided information services to the pharmaceutical industry, he learned that one of his clients, DuPont Merck, had an IT services need in Delaware that his local company could not fulfill. He started Paragon Technology Group with DuPont Merck as his first client and later returned to Washington, adding more clients and growing the company.

But, as Sassan explains, “By 2001 there was a contraction in the information sector, so I approached Gazelle, who had senior leadership roles in various telecom organizations, and I said, ‘You are in this field. You know the client perspective. Why don’t we change our strategy? Instead of serving companies, we’ll target the federal government.’ So, we had a new strategic plan, and I now had a partner.”

They strategized together about how to survive the tough market, and stuck with their initial goal of penetrating the government sector. The task was not easy, but they persevered and suc-

ceeded. When asked about working together, Gazelle says with a smile, “I gave it six months at the beginning.” In fact, Paragon flourished, and the couple took the company from five to 240 employees before selling it in 2012.

During the time leading up to the sale of the company and after, they became active with SEAS. “We got engaged with the school again, and I really, really like that,” says Sassan. “I wish it [had been] earlier. We all get caught up in our lives, raising kids, running a business, and if there is no pull from the school side, we wouldn’t step in, perhaps.”

But step in, they did. They joined the SEAS National Advisory Council and provided both funding and judging expertise for the SEAS Student Research and Development Showcase. In August of this year, Gazelle was the guest speaker at the Clark Engineering Scholars boot camp, advising the scholars on leadership in technical organizations. She also is serving the program as a one-on-one mentor to one of the scholars. On top of this, Sassan and Gazelle made a gift to SEAS to support the new Science and Engineering Hall after they sold Paragon.

As the couple consider their next steps, they remain busy not only with the professional side of their lives but also with personal and other philanthropic activities. “I’m looking at new and different business opportunities, but I’m also becoming more involved at my kids’ schools, and with philanthropy,” says Gazelle. “Most of all, I’m enjoying our kids, Alex [age 14] and Tara [age 11], while they’re home.”

Sassan adds, “My personal interest is in the education of our kids. Through our engagement with my son’s school and my daughter’s school, we’re trying to help reinforce and enable their STEM [science, technology, engineering, and math] programs.”

That interest, by the way, extends far beyond the education of their own children. Whether speaking to high school or college students, Sassan and Gazelle encourage them to pursue technical fields, particularly engineering. Says Gazelle, “It’s an amazing foundation for whatever it is they want to do with their lives after school. They can’t go wrong with an engineering degree under their belts.”

## News

### SEAS Offers New Graduate Cybersecurity Program

SEAS launched a new graduate degree program in cybersecurity this fall to help meet the rapidly increasing global demand for experts able to confront the growing threat of cyber crime.

The degree, a computer science-oriented master's of science in cybersecurity, is the first of its kind in Washington, D.C., and one of only a handful of graduate degrees in cybersecurity offered among top U.S. universities, according to Professor Abdou Youssef, chairman of the Department of Computer Science.

"The Internet has provided all of us with unprecedented access and the ability to connect, share, and conduct commerce in our pajamas from our bedrooms," says Youssef. The price of that access, however, has been added risk—to privacy, to intellectual property, to national security and critical infrastructure, and to the global economy.

"The country and the world are in dire need of cybersecurity experts to protect our cyber infrastructure," he says. "To secure that infrastructure requires 10,000 to 30,000 technical cybersecurity experts, yet there are currently no more than 1,000 qualified experts nationwide."

It's a concern that experts at some of the highest levels have been voicing as well. "There isn't a corporation in the nation that can successfully defend itself, not one," former Director of National Intelligence Mike McConnell said at a panel event hosted last winter by GW's Homeland Security Policy Institute.

And last fall, at an event co-sponsored by GW's Cyber Security Policy and Research Institute, Secretary of Homeland Security Janet Napolitano said cyber attacks "are increasing in frequency, in complexity, and in consequence." Asked how many serious cyber crimes had probably occurred in the U.S. during her 45 minutes or so on-stage, she said: "Thousands."

According to Youssef, the SEAS program stands out among its peers in its balance between technical depth and multidisciplinary breadth. "As much as 30 percent of the program provides students a solid grounding in foundational computer science;

50 percent of the courses focus entirely on core technical aspects of cybersecurity; and 20 percent of the program gives the students the flexibility to acquire a broader perspective on cybersecurity in its managerial, legal, and policy aspects."

In addition to the required courses—covering, for instance, algorithms and applied cryptography—the program offers a lot of room for individual customization. "We left the door wide open," says Youssef.

**EDITOR'S NOTE:** Major portions of this article are excerpted from "A Degree of Security in Cyber Space," published by *GW Today*.

### Six Students Named Clark Scholars

In April of last year, six members of the SEAS freshman class were named Clark Engineering Scholars, doubling the number of students in the two-year old program. Nicholas Asarese, Emily Fusco, Andrea Lehn, Josephine Mascher, Allan Richmond Morales, and Shayda Shahbazi are the newest scholars, a talented group of students who represent a broad range of interests and majors across the school.

The Clark Engineering Scholarship program was established in January 2011, with an \$8 million gift from A. James Clark, chairman of the board and CEO of Clark Enterprises, Inc. Its purpose is to provide annual, merit-based scholarships and leadership training for the school's top undergraduate students. And according to Professor Murray Snyder, director of the program, that is exactly what the students are receiving.

"One of the more important aspects is that they all have mentors who are either in the same field or a related field," states Snyder. "The ability to interact with experienced engineers, many of whom are recent SEAS graduates and who know what their experiences are, is a real benefit."

The annual boot camp is another benefit of the leadership training that the students receive. This fall the scholars' three-day boot camp began with sessions on business and dining etiquette, how to find appropriate internships, and how to navigate the graduate school application process, as well as a keynote presentation by Ms. Gazelle Hashemian (SEAS '97) on how to succeed in a complex technical field. The boot camp also included individual resume review sessions, during which the scholars received advice from SEAS National Advisory Council members, as well as team building exercises, mentoring activities, and a session on the SEAS study abroad programs.

In November, the Clark Engineering Scholars program also sponsored a talk at GW by Dr. Errol Arkilic, a program manager in the National Science Foundation's (NSF) Office of Integrative Activities. The scholars were invited to join Dr. Arkilic for a private dinner following his presentation on the role of NSF funding for small business innovation.

In addition to these activities, each of the scholars took summer internships or research positions, and all of them study abroad during their sophomore or junior years. Five of the six scholars from the 2011 class went to University College, Dublin (Ireland), while one attended Korea University.

The 2012 Clark Scholars (back row) with Mr. A. James Clark (front row, center), Dean David Dolling (front row, second from left) and other members of the SEAS and GW administrations



JESSICA MCCONNELL/BUFF/GWU



JESSICA MCCONNELL-BURTON



Former President Bill Clinton congratulates SEAS student Matt Wilkins (second from left), Jon Torrey (right) and GWSB student Chris Deschenes (second from right)

## Pedal Forward

At about this time last year, people passing by the garage entrance to Tompkins Hall in the late afternoon and early evening hours could often see SEAS students Matt Wilkins or Jon Torrey at work—with a blow torch in one hand and a long piece of bamboo in the other. Those who were curious enough to ask them what they were doing were given a brief tutorial on the properties of bamboo that make it an ideal material for building bicycles.

What started out as a side project for Wilkins and Torrey turned out to be the winning idea in the 2012 Clinton Global Initiative University (CGI U), a weekend-long event hosted by GW in March that brought together more than 1,000 students from 300 universities, all 50 states, and 82 countries to discuss solutions to pressing global issues.

Wilkins, an avid cyclist, has long been interested in building his own bikes. “I started thinking of different building materials to use. Steel is boring; aluminum is too hard; titanium is too expensive,” he says. “So I went to Google and saw that people make bikes out of bamboo. It immediately clicked in my head: I have bamboo in my backyard. I can cut this down, and it’ll cost me nothing.”

He enlisted Torrey, a fellow SEAS student and friend, to help him with the project. “Bamboo’s been used to build bikes—

to build anything, [including] structures and scaffolding—for a long time,” Torrey explains. “If you take bamboo and you heat- and pressure-treat it, the cellulose cells collapse and form really strong bonds. It’s as strong as a metal.”

Not only that, Wilkins adds, but it’s also a luxury material. “Carbon fiber is the top-grade material for bike frames—the most expensive, the lightest—and what’s best about it is its shock absorbency, so if you ride over bumps it feels like you’re sitting on a cloud. But treated bamboo is actually four times more shock absorbent than carbon fiber.” It’s also lighter than aluminum and, of course, exponentially cheaper than either.

Chris Deschenes, then a student in GW’s School of Business and a friend of Wilkins and Torrey, knew of their project and helped move it forward. He found out that GW would be hosting CGI U and saw the potential for his friends’ project to become something more than a hobby.

The three teamed up to form “Panda Cycles,” believing it could offer another, sustainable and less expensive option for biking, which is an extensively used means of transportation for people in developing countries and a simple, green solution to problems like urban traffic congestion. The trio could build bamboo bikes—generally priced like works of art, at up to \$8,000—to

sell for between \$150 and \$300. For each bike sold, they would donate one to the grassroots organization Bicycles for Humanity, which in turn would distribute them to communities across Africa.

“A lot of people I talked to had Africa-focused commitments, and all of them in some way needed a transportation aspect,” Wilkins says. “We spoke with a few people that wanted, once we were up and running, to link up with us to provide that transportation.”

This innovative project is now called “Pedal Forward,” and it has caught the eye of many. Presenting the team with the winning trophy, the former president praised their initiative as “possibly the beginning of a sustainable livelihood for people all over the world.” Comedian Jon Stewart, who participated in the CGI U ceremony and spent time backstage chatting with Wilkins, Torrey, and Deschenes, was impressed enough to mention it on his Comedy Central show.

Now, several months later, the team is still very focused on their commitment to action—“to get more people, both here in the U.S. and around the world, on bikes”—and Wilkins, who still attends SEAS, is seeking investments from venture capitalists. He hopes to raise enough capital to be able to purchase bike materials at wholesale prices and to invest in an automated manufacturing process. Pedal Forward has continued to receive positive publicity in recent months and has many interested investors, including Mayor Mark Mallory of Cincinnati.

**EDITOR’S NOTE:** Major portions of this article are excerpted from “Two Wheels on a Mission,” written by Ruth Steinhardt and published by *GW magazine*.

## Annual Showcase Highlights Student Research

The Marvin Center’s Grand Ballroom was abuzz with activity last February at the 2012 SEAS Student Research and Development Showcase: guests weaved their way through the packed venue, mingling with the students and each other, while judges with looks of concentration on their faces moved from poster to poster, watching, listening, and asking questions of the student presenters.

Nearly 75 graduate and undergraduate students participated in the showcase, competing for \$14,000 in prize money

awarded to the top three posters and the best undergraduate poster. Student entries came from across the school, covering aerospace, biomedical, civil, computer, electrical, environmental, mechanical, and systems engineering, as well as computer science and engineering management.

The competition's \$5,000 first-place prize went to Anastasia Wengrowski and Rafael Jaimes of the Department of Electrical and Computer Engineering for their successful effort to correlate metabolic and electrical activity in the heart in order to understand how metabolism causes electrical disturbances in the heart. Wengrowski and Jaimes conduct their research under the guidance of Professor Matthew Kay, their research advisor and a member of the Department of Electrical and Computer Engineering faculty.

The \$4,000 second-place prize was awarded to Ritu Bajpai, also of the Department of Electrical and Computer Engineering, for her work in fabricating highly sensitive, UV-assisted alcohol sensors. Her work is part of a collaborative research project between the GW MEMS Laboratory—headed by her advisor, Professor Mona Zaghoul—and the National Institute of Standards and Technology. Ms. Bajpai explained that alcohol sensors are important in industrial settings, where they are used to detect air purity and to serve as chemical alarms.

Graduate students Paul Moubarak and Zhou Ma and their teammate, undergraduate Eric Alvarez, took the \$3,000 third-place prize for

their project, a docking interface for modular robotics. Unlike rigid structure robots, these reconfigurable robots cannot normally operate in rough terrain. Working with their advisor, Professor Pinhas Ben-Tzvi of the Department of Mechanical and Aerospace Engineering (MAE), the team is developing a solution to this problem by creating a docking interface that will help the robot manage rough terrain by exhibiting characteristics similar to a rigid structure robot.

The \$2,000 best undergraduate poster prize was awarded to Nathaniel Diskint and Caitlin Keating, both of the Columbian College of Arts and Sciences. Working with MAE Professor Michael Plesniak, they demonstrated a theory of a pressure-independent, flow rate regulator for syringes, which could have applications for military and ambulatory medicine.

In addition to the poster competition, the showcase featured a keynote address by Mr. Sid Banerjee, CEO and co-founder of Clarabridge, a text analytics software company. It also provided a venue for students, alumni, and investors to network and explore opportunities for forming partnerships and collaborating on cutting-edge research and promising technologies.

SEAS thanks Turner Construction Company, Goya Foods, The Bruce J. Heim Foundation, Alion Science and Technology Corporation, Capital Construction Consultants, Hegarty Research, and ICES Corporation for their generous support and sponsorship of the 2012 Showcase.

*Left to right: Zhou Ma, Paul Moubarak, Eric Alvarez and their research advisor, Professor Pinhas Ben-Tzvi, celebrate their third place prize*



TEAM CAPITOL dc

## Team Capitol dc to Compete in 2013 Solar Decathlon

Autumn has come and gone, but the students and faculty on the Team Capitol dc solar decathlon project are still thinking of the harvest. The harvest they have in mind is not one of crops, but of solar energy.

The idea originated back in March 2011, when The Catholic University of America (CUA) invited GW students and faculty to join them in submitting a proposal for the U.S. Department of Energy's 2013 Solar Decathlon, which will be held in Irvine, CA, in October of next year. CUA also invited American University (AU) to join Team Capitol dc, and the three universities won one of the 20 coveted spots in the competition.

The Solar Decathlon is a biennial competition that challenges 20 collegiate teams from all around the world to design, construct, and operate solar-powered homes that are both energy-efficient and aesthetically appealing. The winner is the team that best balances all ten competitions that address the market appeal and design of the home, while optimizing energy production and maximizing efficiency.

Team Capitol dc's Harvest Home will be built for a returning injured veteran and will include components to help enhance his or her independence. Sticking to the harvest theme, it will also harvest: solar energy through its photovoltaic array and solar thermal system to both produce energy and heat water; excess heat from its solar panels and appliances, reusing it instead of putting it to waste; water through a rainwater collection system; and wind through natural ventilation. It will even provide a small garden so the home owner can harvest fruits, vegetables, herbs, and flowers.

Each of the contributing departments has been working on its tasks, and the team is set to begin building the structure this coming spring on the CUA's

ELLIE KAUFMAN

School of Architecture and Planning is the lead on the project and will be responsible for the architecture, and AU's Film and Media Arts Division and Center for Environmental Film-Making are covering media and public relations for the project. GW's interior design and landscape design programs are responsible for the home's interior and landscape designs, respectively. And SEAS students and faculty are responsible for the structural engineering, the mechanical and electrical engineering, and the plumbing.

"Our students did most of the design on the structure as well as the mechanical systems and plumbing last summer," says Professor Kim Roddis of the Department of Civil and Environmental Engineering. "Students in the [Electrical and Computer Engineering] design course are designing the photovoltaics and the biomedical monitoring systems."

Arup, an international engineering design firm, has partnered with GW on the project, and according to Roddis, it hired two SEAS students last summer who worked on the energy consumption issues, which she described as "very challenging."

Roddis credits the students with the energy, ideas, and effort that are propelling the team. "This is a student led design contest, and it's a great problem solving project. Faculty provide resources that the students wouldn't be able to get on their own and they facilitate making contacts, but we don't tell them the specifics of how to design this," she says. "This is all student driven."

Danielle Barsky, Caroline Litchfield, and Lauren Wingo are the SEAS student leaders on the project, and a number of other SEAS students are participating as team members.

For more information on the project, please visit [www.teamcapitoldc.org](http://www.teamcapitoldc.org).

**EDITOR'S NOTE:** GW faculty advisors to the project include Professor Kim Roddis, Professor Thomas Manuccia (Department of Electrical and Computer Engineering), Professors Lauren Wheeler and Adele Ashkar (Landscape Design Program), and Professor Catherine Anderson (Interior Design Program).



CEDRIC HICHSFACHT ILLUSTRATION

### SEAS Unveils "Superheroes"

They look to be your average college professors, mild-mannered men and women who go about their daily business of teaching classes and conducting research. But looks can be deceiving.

In a new and unconventional online marketing campaign launched during the spring 2012 semester, SEAS has turned its faculty into superheroes to draw attention to the school's research. Called "IMPACT: The SEAS Superheroes," the series features a different faculty member in each episode. Responding to emergency calls for help, these ordinary faculty members transform into superheroes who possess extraordinary engineering and computer science powers that they use to make the world a safer, healthier, and more comfortable place to live.

"We recognize that most people receive a huge volume of e-mail, magazines, and other material that vies for their attention, and we wanted to develop something that would stand out from the crowd and cause people to stop and take a look," says SEAS Dean David Dolling. "I think IMPACT does that. It's something different and fun, but it still accomplishes our purpose, which is to show people that SEAS faculty members are doing important research."

The IMPACT comic has two main target audiences. The first is high school students—both those who are already interested in engineering and plan to apply to engineering schools, and those who like science and math but aren't entirely sure where to go

with their interest. The second target audience is people who are interested in SEAS research itself—administrators at other research institutions, faculty members' peers at other universities, funding agencies and federal labs. "We want to get the word out to that audience about the research we're doing at SEAS. The comic is just an entry point," says Joanne Welsh, the SEAS director of communications.

Answering to names such as RobotronMan, The Aggregator, The Imager, and others, the SEAS superheroes might seem silly or unserious at first, but the engineering depicted in the comic strips is 100 percent legitimate. The storylines are based on the actual research SEAS faculty and their students are conducting.

The response to the IMPACT campaign has been positive, with SEAS receiving attention both inside and outside of GW. It has received mentions in *Scientific American's* "Budding Scientist" blog, the National Science Foundation's "Science 360" online news service, and the American Society of Engineering Education's *PRISM* magazine, as well as numerous Twitter mentions by Stanford University, the National Society of Professional Engineers, MIT's Leaders for Global Operations, and others.

To read the latest episode of the SEAS superheroes' adventures, visit [www.seas.gwu.edu/IMPACT](http://www.seas.gwu.edu/IMPACT). To find links to all the episodes or to sign up for a free copy of the IMPACT booklet, visit [www.seas.gwu.edu/IMPACT/team\\_impact.html](http://www.seas.gwu.edu/IMPACT/team_impact.html).

## New Faculty



### Dr. Erica Gralla

Erica Gralla is an assistant professor in the Department of Engineering Management and Systems Engineering. She completed her Ph.D. at the Massachusetts Institute of Technology in the Engineering Systems Division. She studies operations management in disaster response and other urgent, uncertain environments. Her research seeks to combine the strengths of human intuition and mathematical models to create better decision-making approaches. She teaches courses in supply chain management and systems engineering.



### Dr. Megan Leftwich

Megan Leftwich joined SEAS in January 2012 as an assistant professor of mechanical and aerospace engineering from Los Alamos National Lab, where she served as the Agnew National Security Postdoctoral Fellow. She holds a Ph.D. from Princeton University. As an experimental fluid dynamicist, her research interests include the hydrodynamics of swimming fish, extreme fluid instabilities, the fluid dynamics of mammalian birth, and novel experimental techniques. Professor Leftwich is a member of the faculty of the Department of Mechanical and Aerospace Engineering.



### Dr. Murray Snyder

Murray Snyder joined SEAS in January 2012 as a research professor in the Department of Mechanical and Aerospace Engineering and as the director of the Clark Engineering Scholars program. Professor Snyder is a retired U.S. Navy captain who served on four nuclear powered submarines, including as commanding officer of USS NEVADA. He obtained his Ph.D. from Johns Hopkins University in 2007. From 2006 to 2011, he was a military professor in the Mechanical Engineering Department at the U.S. Naval Academy. His main research interests are computational and experimental fluid dynamics, specifically the impact of ship air wakes on rotary wing aircraft.



### Dr. Volker Sorger

Volker Sorger is an assistant professor in the Department of Electrical and Computer Engineering. He received his Ph.D. from the University of California-Berkeley, where he conducted research in the fields of nanoscale opto-electronics and novel materials exploration. His research areas at GW include enhanced light-matter interactions, opto-electronics, silicon photonics, plasmonics, novel materials, and solar-to-energy conversion. Prior to coming to GW, Professor Sorger was a group leading, post-doctoral researcher at the NSF Nanoscience and Engineering Center at UC Berkeley and gained valuable industry experience in Intel Corporation's research labs.

JESSICA MCCONNELL-BURTON/GWU



Left to right: Professors Yongsheng Leng and Gabriel Parmer, Dean David Dolling, and Professors Edward Della Torre and Kim Roddis

## SEAS Celebrates Faculty Excellence

Colleagues, students, friends, and family members gathered at GW's Marvin Center last April to celebrate the successes of SEAS Professors Edward Della Torre, W.M. Kim Roddis, Yongsheng Leng, and Gabriel Parmer, as they were honored for their teaching and research accomplishments at the 2012 SEAS Faculty Research and Teaching Awards Presentation.

Professor Edward Della Torre of the Department of Electrical and Computer Engineering was named the 2012 SEAS Distinguished Researcher for his success as a scholar and researcher in the field of magnetic material behavior and modeling.

"In the course of his career—one in which he has received national and international recognition—Professor Della Torre has discovered and analyzed the Bose-Einstein condensation of magnons, developed a 3D Preisach model, analyzed 3D accommodation of hysteresis, and developed a theory of the magnetic phases in Heusler alloys," stated SEAS Dean David Dolling. In addition, Professor Della Torre has 18 patents to his name, has authored or co-authored three books, and is a Fellow of the IEEE Magnetics Society and the American Physical Society.

Professor Kim Roddis of the Department of Civil and Environmental Engineering was named the 2012 SEAS Distinguished Teacher. Using some string, a pair of scissors, and a handful of student volunteers to model changes in load bearing columns, she delighted the audience with a

demonstration of the hands-on teaching techniques for which she is known.

Noting that undergraduates in the Department of Civil and Environmental Engineering have selected her as "Professor of the Year" three times in eight years, Dean Dolling remarked, "Professor Roddis has developed a very successful teaching approach that combines enthusiasm for her field, genuine interest in her students' development, and an emphasis on hands-on projects to introduce them to the fundamentals of civil and environmental engineering."

The 2012 SEAS Outstanding Young Researcher Award was presented to Professor Yongsheng Leng of the Department of Mechanical and Aerospace Engineering for his research in the field of molecular modeling of nanosystems.

In less than four years at SEAS, Professor Leng has developed a strong research group; published eight papers that add to his impressive publication record of 40-plus papers; and received four grants, including the prestigious 2012 National Science Foundation (NSF) Faculty Early Career Development (CAREER) Award. More importantly, commented Dean Dolling, "His contributions to the field are widely recognized as original and pioneering and as having a profound influence on molecular electronics research."

Professor Gabriel Parmer received the 2012 SEAS Outstanding Young Teacher Award, his fourth teaching award at GW. He received his previous awards from students,

who recognized his talent and passion for teaching and honored him with three such awards in his first two years at GW.

In his introduction of Professor Parmer, Dean Dolling remarked that several students had made a point to mention that Professor Parmer's popularity is not due to his teaching easy courses. "In fact, they say that his operating systems course is considered both one of the hardest courses in the computer science curriculum and one which students tell each other 'you have to take' because they consider it so valuable," he said.

Called a "teacher-scholar model" by his department chairman, Professor Parmer is also doing very successful research, and like Professor Leng, he received a 2012 NSF CAREER Award.

## SEAS Research Review

SEAS faculty received nearly \$15 million in funding during fiscal year 2011-2012. With support from the National Science Foundation (NSF), governmental agencies and laboratories, private sector partners, and non-profit foundations, SEAS faculty members continued to work on solutions to challenges that confront us in healthcare, transportation safety, national security, energy, cybersecurity, and other sectors.

The largest share of the research was conducted under NSF grants. Faculty from across the school worked individually, with colleagues from other SEAS and GW departments, and in many cases with colleagues at other universities.

In computer science, Professors Hyeong-Ah Choi and Xiuzhen "Susan" Cheng received \$680,000 for their work on cognitive radio network issues. Professor Michael Plesniak received \$318,000 to study a fundamental biofluid dynamics problem, while Professor Tarek El-Ghazawi began working with colleagues from GW's Columbian College of Arts and Sciences on a \$1.69 million NSF Sustainable Energy Program project. Other SEAS faculty collaborated with researchers from Johns Hopkins University, Cornell University, the University of Washington, and Texas A&M, among others.

During the year, faculty also began new research with numerous federal agencies and labs. A partial list includes the Defense Advanced Research Projects Agency (DARPA), NASA, the CIA, the Department of Energy, the Air Force Office of Scientific Research, and the Office of Naval Research.

Under an \$862,000 Department of Energy grant, Professors Philippe Bardet, Elias Balaras, and Majid Manzari started work with France's CEA (Atomic Energy and Alternative Energies Commission) and Argonne National Laboratory to perform multi-scale measurements and simulations of nuclear reactor fuel assemblies during earthquake events. Professor Michael Keidar worked with Georgia Tech researchers on a study of plasma-wall sheath transport phenomena; the GW portion of this grant is \$386,000. And Professor Zoe Szajnfarber was awarded a \$100,000 grant from NASA to identify strategies to encourage innovation at NASA through organizational design and technology investment.

In addition to funding from federal agencies, SEAS faculty also won funding from a number of foundations, corporations, non-profit organizations and others. Among them is the \$121,000 grant that Professor Gabriel Sibley received from Toyota Motor Engineering and Manufacturing North America to develop robust visual perception technology for autonomous vehicle navigation. In civil engineering, Professor Tianshu Li received a \$100,000 American Chemical Society Petroleum Research Fund Doctoral Investigator Award to study the nucleation mechanism of methane hydrates, an ice-like compound that stores enormous amounts of energy in nature.

**New Faculty Win Major Research Grants**

If the old saying "The proof is in the pudding" is correct, then the recent faculty hiring underway at SEAS is positioning the school for significant research success in the next several years. Already, the new faculty are enjoying a good deal of it in their bids for highly prestigious and competitive national grants.

In the last academic year, three recently hired assistant professors received National Science Foundation (NSF) Faculty Early Career Development (CAREER) grants, while one received an Air Force Office of Scientific Research (AFOSR) Young Investigator Research Award.

Responding to the news of the grants, SEAS Dean David Dolling said, "This is a 'first' for SEAS, and big news. It's the sort of accomplishment that any engineering school—including the top schools in the country—aims for, and we're thrilled about it.



Clarkson



Venkataramani



Parmer



Leng

Competition for these awards is very stiff, and this is a nice validation of the successful hiring we have undertaken at SEAS over the past few years."

CAREER grants, which are the most prestigious awards given by the NSF to junior faculty, are offered to faculty members who excel at both research and teaching. Each of the awards is worth approximately \$400,000 over five years. The AFOSR Young Investigator Research Awards are also very prestigious awards and are given only to young faculty who show exceptional ability and promise for conducting basic research.

The winners of the NSF awards are Professor Yongsheng Leng of the Department of Mechanical and Aerospace Engineering, Professor Gabriel Parmer of the Department of Computer Science, and Professor Guru Prasad Venkataramani of the Department of Electrical and Computer Engineering.

Professor Leng's research involves developing a computational framework to investigate structural properties in liquid films, a type of material which is typically only a few nanometers thick. This research can be applied to the lubrication in car engines to increase engine efficiency. Leng's proposal also includes education and outreach components that involve local high school students at Washington, D.C.'s School Without Walls, as well as undergraduate and graduate students at GW.

Professor Parmer's research investigates methods to make computer systems essentially self-repairing—able to recover from faults and to resume predictable operation. His proposal is to develop a new operating system structure for real-time systems—the systems that control our physical world, such as the millions of lines of computer code running a Boeing aircraft's flight systems. Parmer has already

been lecturing about computer programming to high school students at Edison Academy in Alexandria, VA, and under the CAREER grant, he plans to expand his involvement with students there who are interested in advanced computing.

Better computing is also the focus of Professor Venkataramani's research. He is interested in improving efficiency in multi-core processors, which power many types of technology we use daily, including smartphones and tablet computers. According to Venkataramani, as more processors are added, one would expect an equal addition in computing power, but in reality, there are many problems in scaling up program execution. His research proposal involves developing an integrated hardware-software approach to overcome the bottlenecks in performance that develop when more cores are added to a system.

Professor Michael Clarkson of the Department of Computer Science is the winner of the AFOSR grant. The objective of his three-year, \$610,000 research project is to make it possible to quantify, and consequently to compare, the security of computing systems. Instead of merely declaring a system to be secure, or not, Clarkson seeks to enable measurement of security in three important areas: privacy, access control, and availability.

# Notable Accomplishments

## Awards & Honors:

**Sameh Badie (CEE):** received the Precast/Prestressed Concrete Institute's (PCI) national 2012 PCI Young Educator Achievement Award.

**Tarek El-Ghazawi (ECE):** was named an IBM Research Faculty Fellow for 2012. He also received the 2012 Alexandar Schwartzkopf Prize for Innovation at the National Science Foundation's Annual Industry/University Cooperative Research Centers Meeting in January 2012.

**James Lee (MAE):** was elected an Honorary Fellow of the Australian Institute of High Energetic Materials. The Honorary Fellow title is awarded to prominent scientists working in the interdisciplinary areas of chemical and mechanical engineering and other relevant subjects.

**Chandru Mirchandani (EMSE adjunct professor):** was awarded a Fulbright Specialist grant in engineering education at the University of Moratuwa, Sri Lanka.

**Joost Santos (EMSE):** was appointed to the editorial board of the American Society of Civil Engineers' *Journal of Infrastructure Systems*.

## Patents & Technology:

**Pinhas Ben-Tzvi (MAE):** was awarded U.S. Patent #8,225,892, "A Mobile Robot with Symbiosis of Locomotion and Manipulation," on July 24, 2012.

**Matthew Kay (ECE):** is a co-creator of a new medical device to aid in treating cardiac arrhythmias. Allied Minds, a technology investment firm, has invested \$500,000 to form a new company called LuxCath to build the device. The device comes from technology developed in Professor Kay's laboratory and the laboratories of his co-inventors, Drs. Marco Mercader (GW Medical Faculty Associates) and Narine Sarvazyan (School of Medicine and Health Sciences).

**Mona Zaghoul (ECE):** is a co-inventor on U.S. Patent #8,018,010, "Circular Surface Acoustic Wave (SAW) Devices, Processes for Making Them, and Methods of Use." The patent was awarded on September 3, 2012 to her and her former doctoral student, Dr. Onur Tigli. Professor Zaghoul and her co-inventors were issued a related

patent, U.S. Patent #8,143,681, B2, on March 27, 2012.

**Jason Zara (ECE):** is a co-inventor on U.S. Patent #8,184,351, "Amplified Bimorph Scanning Mirror, Optical System and Method of Scanning." The patent was awarded on May 22, 2012 to Professor Zara, Patrick Mills, Paul Patterson, and Stephen Smith.

## Media Mentions:

**Evan Drumwright (CS):** was quoted in "Robots Are Learning to Take Care of Pets," a January 20, 2012 blog article on *Forbes.com*. The article discusses the work being done by students in Professor Drumwright's robotics course.

**Michael Duffey (EMSE):** wrote the guest article, "Hot Bots: How Arduino Teaches Kids the Science behind Modern Gizmos," for the September 28, 2012 *Scientific American's* "Budding Scientist" blog.

**Tarek El-Ghazawi (ECE):** was quoted in "China's Homegrown Supercomputers," an article in the January 2012 issue of the *IEEE Spectrum*.

**Azim Eskandarian (CEE):** responded to several media requests in September 2012 to discuss autonomous driving. He was quoted in the September 18 *CNN Tech* article, "You won't need a driver's license by 2040," and the September 25 *Forbes* article, "Self-Driving Cars Will Take Over By 2040." On September 27, he participated in a discussion on autonomous vehicles on NPR's Dianne Rehm Show.

**Lance Hoffman (CS):** was featured in a CNN piece on the need for cybersecurity specialists, which aired the weekend of April 21, 2012. On July 16, he also was featured on a CBS 2 piece on cybersecurity jobs in the U.S.

**Michael Keidar (MAE):** was quoted in *Science Magazine's* April 4, 2012 article, "Plasma Flashlight Zaps Bacteria."

**Julie Ryan (EMSE):** was quoted in the August 1, 2012 *Propublica* article, "Does Cybercrime Really Cost \$1 Trillion?"

## Books:

**Azim Eskandarian (CEE):** is the chief editor and author/co-author of five

chapters in the *Handbook of Intelligent Vehicles*, a new reference book published by Springer.

**Cynthia Gayton (EMSE adjunct professor):** is the author of *Legal Aspects of Engineering* (9th Edition), a book recently released by Kendall Hunt Publishing.

## DEPARTMENT KEY:

**CEE:** Department of Civil & Environmental Engineering

**CS:** Department of Computer Science

**ECE:** Department of Electrical & Computer Engineering

**EMSE:** Department of Engineering Management & Systems Engineering

**MAE:** Department of Mechanical & Aerospace Engineering



## In Memoriam

SEAS extends its condolences to the family of **Sam Rothman**, professor emeritus of engineering administration, who passed away on February 12, 2012 at the age of 92. After retiring from his previous career, Professor Rothman joined the SEAS faculty in 1974 as a research professor in the Department of Engineering Administration (now the Department of Engineering Management and Systems Engineering), and six months later was asked to serve as the department chairman. He served as chairman for nine years, helping to grow the department's on-campus and off-campus engineering administration programs. He moved to part-time status in 1985 and officially retired from GW in 1990.

Prior to joining the SEAS faculty, Professor Rothman served as a Weatherman in the Army, and worked for the National Bureau of Standards and the U.S. Navy.

## Achievement



Claire Powers

### An “Ah-ha” Moment

Originally from Texas, Claire Powers knew that when it came time to select a college, she wanted to leave her hometown and explore other parts of the United States. She visited several schools throughout the country, and what she found at GW took her by surprise: an impressive city campus in the heart of a unique city.

While she relied on her own eyes and ears to choose a college, she decided to trust a career aptitude test to help her select a major. The test recommended urban planning. And with that bit of advice, Claire decided that her math and science background would be a good fit with the field of civil engineering. Little did she know at the time that part of her civil engineering education would include playing an integral role in the first major programming for the GW chapter of Engineers Without Borders (EWB).

EWB collaborates with local partners to design and implement sustainable engineering projects worldwide. Chapters throughout the world work on various projects, and the GW chapter elected to participate in a five-year project to build latrines in La Peña, El Salvador. The chapter is young and had just begun to organize when Claire stepped in as a junior after coming back from a semester abroad her sophomore year in Dublin, Ireland.

“I was sitting in a class and I had an ‘ah-ha’ moment,” Claire says of her experience in

Dublin, which would lead to her involvement in EWB. “I knew I was meant to be a civil engineer.” When she returned to GW, she decided to join EWB to apply her civil engineering knowledge to community service and to have the opportunity to travel. “I traveled to developing countries in high school, and I’ve always been involved in non-profits,” she says. “To be able to do good with engineering is great.”

Claire—along with some of her best friends, whom she had made in Dublin—helped the chapter grow and helped prepare the assessment trip to La Peña and the follow on trip in spring 2012, during which six students and two mentors started working with the community to build the latrines. “It’s my baby,” she says with a smile. “I’d like to say I got the ball rolling. The new executive board is taking it further and our chapter has really grown a lot.”

Claire graduated last May, leaving the chapter in other hands and leaving GW for the University of Texas at Austin, where she is pursuing a master’s degree in civil engineering. “I’ve always been a southern girl at heart,” she confesses. “I miss it and I’m ready for another change.”

### No Regrets

At age 17, Yijing “Fiona” Zhou had quite a tall order before her: she had to convince her parents to let her leave China to attend college in the U.S. “It was a huge decision for my mom to send a 17-year-old daughter to the other side of the world,” Fiona recalls. “I actually had a kind of deal with my parents that if I could get a scholarship from the schools that I applied to, I would be able to go there.”

Fiona knew that GW has a program that combines computer science and business, and she had her heart set on coming here for school. Unfortunately, the GW application deadline had already passed, so she enrolled as a freshman at St. John’s University in New York and then transferred to GW as a sophomore.

“Being an international student here, I’m really grateful that I studied at SEAS,” she says. Once here, she quickly learned about the school and took advantage of the opportunities it offers. During her undergraduate studies at SEAS, she was active in the SEAS-SPAN mentoring program, worked as a student staff member in the SEAS

undergraduate advising center, and was a member of the Chinese Cultural Association for Students and the GW chapter of ACM, a national computer science association.

By her own assessment, Fiona learned a great deal during her undergraduate studies. She learned that her instincts about her academic interests were correct and that she wants to use her computer science education and programming skills in the business world. She also learned how to be independent and responsible. “I wanted to be pushed out of my comfort zone, and I felt like study abroad would be a better option for me,” she contends. “I wouldn’t be so independent if I had gone to college in China, because here I have to deal with problems without my parents’ help.”

Fiona received her bachelor’s degree in computer science last spring and chose to remain at SEAS to complete a graduate degree in engineering management. She also chose to remain a student staff member in the SEAS undergraduate advising center, where she continues working with the director, Mr. Howard Davis, whom she considers “a great mentor as well as a great boss.”

Fiona is glad that she decided to study abroad, and she advises other international students to do the same. “I met people I never would have imagined meeting if I had studied in China. I would encourage international students to start early if they have a dream of studying abroad,” she states.

And her mother—how does she feel in retrospect? Fiona replies thoughtfully, “I actually asked her recently if she regretted her decision to let me go, and she said, ‘No, it’s one of the best decisions I’ve ever made.’”

Fiona Zhou







Danielle Barsky

### One Thing Leads to Another

Listening to Danielle Barsky talk about her undergraduate experience at SEAS, one gets the image of a student who worked quietly and diligently throughout her four years, never grabbing the spotlight but becoming more confident with each year. Danielle, the 2012 SEAS Distinguished Scholar, dedicated herself to her studies from the start and became steadily more involved in school activities each year. By graduation time, she was known to classmates not only for her scholarship but for her involvement, as well.

Although she joined the Alpha Kappa Psi business fraternity her freshman year, Danielle did not get involved in SEAS activities right away. During her sophomore year, however, she decided to participate in the inaugural semester of the SEAS study abroad program with University College, Dublin. Ireland might not be an obvious place in which to put down strong roots to SEAS, but it worked for Danielle. “That got me interested in pursuing more engineering activities,” she says.

When she returned to SEAS the next semester, she became involved in a series of extra-curricular activities. Over the course of her junior and senior years, she joined the engineering honor society, Tau Beta Pi; the mechanical engineering honor society, Pi Tau Sigma; the GW chapter of the American Society of Mechanical Engineers; and the SEAS peer mentor program. “I really believe that one opportunity leads to another—that’s been my experience,” she reflects.

During her junior year she also began doing research in Professor Pinhas Ben-Tzvi’s

Robotics and Mechatronics Laboratory, and through her work in the lab, she became known to other SEAS students, including Micah Foster. Micah was the lead on the GW Microgravity Team, a group that prepared a proposal to conduct an experiment on NASA’s microgravity airplane. He heard about Danielle’s research and asked her to join the GW team, ZeroGW. As Danielle says, one opportunity led to another, and she found herself aboard the “Weightless Wonder” conducting an experiment in microgravity conditions. “ZeroGW and going abroad were definitely the highlights of my SEAS career,” she exclaims.

As it turns out, that opportunity led to yet another. Following the team’s participation in the microgravity project, Danielle was invited to present her research at a competition held each spring by the local chapter of the Society of Satellite Professionals International (SSPI).

Danielle has decided to remain at SEAS to study for a master’s degree, and as she looks back at her undergraduate experiences, she concludes, “Having an open mind allowed me to explore new opportunities at SEAS, meet new people, and enhance my academic experience.”

### Students Compete for Senior Design Award

Demonstrating some of the most impressive senior design projects to date, SEAS students showed off their engineering skills and creativity last spring at the school’s third annual Pelton Award for Outstanding Senior Project.

Projects ranged from human-computer interaction technology to moving side view mirrors for blind spot detection. And one team of students even filed a provisional patent application with the university’s Office of Technology Transfer for its project, an ultrasound-based shoe bomb detector.

Five student teams were selected from among the senior class to compete in the school-wide competition. Esther Akinngagbe, Samah Beg, and Taylor Gould presented “Phantoms of the Breast and Breast Cancer Lesions for X-ray Imaging Systems.” William Henry, Claire Powers, and Anna Weiser-Woodward displayed a “Design of GMU University Hall.” Thomas Bergen, Ashley Friend, and Alexandros Sofianos presented findings on an “Ultrasound-based Shoe Bomb Detector,” while Allison Hogarth and David Perry offered their project, “Moving Side

View Mirrors for Blind Spot Detection.” And Xiaolong Jiang demonstrated “Magic Hands: A New Generation of Human-Computer-Interaction Technology.”

The team led by Thomas Bergen, Ashley Friend, and Alexandros Sofianos took first place, while Allison Hogarth and David Perry claimed the runner-up award. Professor Vesna Zderic, a faculty mentor for the winning team, credited their ability “to independently design, develop, manufacture, and test a fully functioning novel device.”

“The Pelton Award is a great incentive for students in the STEM [science, technology, engineering, and math] fields to be innovative,” said Professor Shahrokh Ahmadi, the coordinator of the competition. “It’s a great stage for students to present their designs to the audience and larger community of current students, faculty, and alumni and, of course, to get recognition for all the hard work they have put into their senior design projects.”

“It was very rewarding to have [our] project come together after all our hard work and then get to share it with the community,” said Alexandros Sofianos, a member of the winning team.

The Pelton Award competition was established in 2010 by Dr. Joseph Pelton, former professor in the school’s Department of Electrical and Computer Engineering. The competition was hosted by SEAS, the National Advisory Council, and the Engineer Alumni Association. Mr. Scott Arney (MS ’75), Mr. Ashok Jha (MS ’92), and Mr. Howard Tischler (MS ’80) generously sponsored a barbeque on the Marvin Center Terrace following the student presentations.



Dean Dolling, Bergen, Friend, and Sofianos

# Honor Roll of SEAS Donors

## Thank You

Support from you—our alumni, parents, corporate partners, foundations, students, faculty, staff, friends, and others—is vitally important to the SEAS transformation. The support that you provide to the school helps make a difference in how far and how fast that transformation advances. It can help us enhance scholarships and fellowships for students, sustain important faculty research, and build new learning initiatives. In short, your generosity strengthens the building blocks of the SEAS transformation: our students and faculty.

Sincerely,



David S. Dolling  
Dean

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Matthew C. Wilkins  
Donna M. Williams  
Jeffery A. Wilson  
Marc B. Wilson  
Walter S. Wingo  
Howard N. Wisnia  
Robert C. Witham  
Patricia Witham\*  
Peter W. Witherell\*  
Michael J. Wojciechowicz  
Adam I. Wolf  
Martin Wolk  
Christopher J. Wolney  
Josef A. Wonsever\*  
Carla M. Wood  
N. D. Wrinkle  
Yue Wu  
Tian Xia  
Jingmu Yang  
Jyuhn-Yuung D. Yang  
Jamie L. Yaniga  
Minoo G. Yavari  
Ali Yazdi\*  
Stephen F. Yee  
Phillip M. Young  
Marsha F. Zaidman  
Sohail K. Zakriya  
Joseph A. Zaloom  
William F. Zeller III  
Lei Zhang

**Key**

Deceased = \*

Five-year consistent donor = +



## From the Office of Development & Alumni Relations

Signs of a profound transformation are emerging all about us at GW's School of Engineering and Applied Science: SEAS welcomed 224 first-year students this fall, our largest incoming class in recent history; we hired six professors this academic year, bringing to 37 our total number of recently hired faculty—many of whom graduated from top 20 engineering programs; and Clark Construction recently completed excavation of the new Science and Engineering Hall site and is beginning to pour concrete foundation footings.

Those of us on campus get an opportunity to see these physical signs of evolution every day. But what is perhaps more important and harder to see—because it's intangible—is the change that first occurred in the hearts and minds of alumni and friends of SEAS like you. Your contributions of time, talents, and financial support have helped us achieve so much to date and have provided a firm foundation for the future.

Each year, countless alumni share their time volunteering for SEAS and the university. Some of you serve as admissions ambassadors helping us recruit the most promising future engineers; some counsel current students during our resume review night, helping them prepare to join the professional world; and others lend a hand by serving as judges at our annual Student Research and Development Showcase or the Pelton Senior Design Competition. However you choose to participate, everyone benefits from these student-alumni interactions. SEAS students are grateful for the insight and knowledge that they gain from you, and many of you in turn report being impressed by what you've seen at these events.

In addition to gifts of time and talent, many members of the SEAS community have made a financial commitment to the transformation of SEAS. Many of you have made

an annual gift to the Dean's Fund, which provides unrestricted support to meet unbudgeted needs and take advantage of opportunities that arise throughout the school year. Others of you work with our development team to make an impact by giving to the Science and Engineering Hall or by creating a legacy through the creation of a bequest.

The following pages list the names of the people who believe that SEAS is a wise investment of their philanthropic resources and who have made SEAS their philanthropic priority. We are honored by their commitment to the school and are grateful for their contributions to our success.

Finally, let me add that our Development and Alumni Relations team looks forward to increasing our outreach to SEAS alumni this new year and hopes to see you, whether at an event or through a personal visit. Our able team of Jo Boukhira and Natalie Grandison serve as associate directors of development and join me in travelling throughout the United States to meet with you and other alumni and friends. Working alongside us is Buthaina Shukri, our new senior associate director of alumni relations for SEAS, who is building on our established events and engagement opportunities and working to find new and innovative ways to keep you connected with the school.

Thank you for all you do for the School of Engineering and Applied Science and for your confidence in the direction we're heading.

Sincerely,

**Alexander Dippold**  
Director  
Development and Alumni Relations  
[dippold@gwu.edu](mailto:dippold@gwu.edu)  
Tel: 202-994-4051

## News

### Supporting the SEAS Transformation

In this space, SEAS takes the opportunity to publicly recognize and thank those who, during the 2011-2012 fiscal year (July 1, 2011 to June 30, 2012), provided gift support for new funds or new programs that are helping to further the SEAS transformation.

**Scott Amey, MS '75, and his wife Deb** received a wonderful response from their challenge fund, which promised a dollar-for-dollar match for gifts to the new Science and Engineering Hall, with a total commitment of \$1 million. As of this writing, we are very pleased to report that many alumni have taken advantage of this generous offer and that we are close to receiving the full match. If you have an interest in this or would like to discuss how you can participate, please call the SEAS Office of Development at 202-994-8474.

**Ibrahim A. Ashie, BS '70, MS '73,** established the Shao Wen Yuan Mechanical Engineering Memorial Scholarship to honor former Professor Shao Wen Yuan. When asked why he created this scholarship, Ibrahim said, "to honor Dr. Yuan because he had such a strong impact on my life... and for mechanical engineering students with the hope that they have the opportunity to learn from professors like him."

**Glen Ballowe, BS '49, and his wife Mary** made a named gift in support of the Science and Engineering Hall. Trained as a civil engineer, Glen enjoyed a very successful career in construction.

**C. Edwin (Ed) Becraft, BS '51,** made a named gift to the Science and Engineering Hall, crediting his professional success to the engineering education he received at SEAS. Ed is a civil engineer and had a 55-year career in the construction industry. On February 18, 2012, he received the Arthur C. Meushaw Award for Special Achievement from the American Subcontractors Association of Metro Washington.

**Dirk S. Brady, BS '43 (deceased), and his wife Judy** made additional funds available for the Dirk S. and Judith W. Brady Scholarship, which provides



financial support for SEAS students.  
(See *"In Memoriam"* on page 36).

**Gurminder S. Bedi, BS '69, and his wife Tricia** provided support for the construction of the Science and Engineering Hall. A long-time member of the SEAS National Advisory Council, Gurminder has played an important role as a volunteer leader.

**Francis (Frank) M. Cevasco, MS '70, and his wife Linda** made a named gift to the Science and Engineering Hall. Frank studied civil engineering and is president of Cevasco International. After attending the groundbreaking for the Science and Engineering Hall, Frank left very impressed by GW's commitment to engineering education and appreciates the opportunity to lend his support.

**Clark Construction Group** established the Clark Construction Engineering Scholarship, which will provide annual scholarships to students majoring in civil engineering.

**Mark W. Cutlip, BS '84, MS '86, and his wife Cristina** made a named gift to the Science and Engineering Hall. Mark valued his engineering education in mechanical engineering, which led to a very successful career in Texas. Currently enjoying raising three sons, Mark appreciated the opportunity to give back to SEAS.

**Howard Eisner, D.Sc. '66**, grateful for his 50-plus year association with SEAS, has established the Howard Eisner Annual Scholarship, which will provide an annual merit-based scholarship to a graduate student pursuing a degree in engineering management and systems engineering. Howard has also worked in industry serving as a manager, executive, and president of two systems engineering companies. In 1994, he received the Outstanding Achievement Award from the GW Engineer Alumni Association, and in the past few years, he has written two new books: *Systems Engineering* (Morgan & Claypool) and *Topics in Systems* (Mercury).

**Aran Hegarty, MS '97, and his wife Fritz Partlow** made a named gift to the Science and Engineering Hall. The president of Hegarty Research, Aran has said that his SEAS education gave him exactly what he

needed to start his own business. A new member of the SEAS National Advisory Council, Aran also sponsored and served as a judge at the 2012 SEAS Student Research and Development Showcase, and most recently participated as a mentor at the first-ever SEAS Engineer Mentor Fair.

**Mark V. Hughes III, BA '69, MS '77, and his wife Susan** made a gift in support of the Dean's Fund, which provides annual unrestricted funds to meet our most critical unbudgeted needs. A member of the George Washington University Board of Trustees and the SEAS National Advisory Council, Mark has played an integral role in advising the GW leadership at SEAS and throughout the university.

**Douglas L. Jones (emeritus professor), BS '63, MS '65, D.Sc. '70, and his wife Mary O'Brien, MS '76**, are dedicated SEAS alumni who have previously funded the Douglas L. Jones Endowed Mechanical Engineering Graduate Fellowship. This year they lent their support to the construction of the Science and Engineering Hall.

**David Karlgaard, D.Sc. '74, and his wife Marilyn** built on their commitment to help support students by fully endowing the Karlgaard Scholarship in Computer Science and the Karlgaard Scholarship in Computer Engineering. When asked why he donates his time and resources to GW, David reflected on the role the university played in enabling his own professional success and on the importance of education in answering so many social problems in the world today.

**Sassan Kimiavi, BS '85, MS '87, D.Sc. '98, and his wife Gazelle Hashemian Kimiavi, MS '97**, made a named gift to the Science and Engineering Hall. New members of the SEAS National Advisory Council, Sassan and Gazelle appreciate the opportunity to re-engage with SEAS. (See *their article, "The Power of Two,"* on page 13).

**Reginald S. Mitchell, BS '65, MS '67**, a dedicated volunteer judge at the annual Pelton Senior Design Competition and a SEAS supporter, Reg made a gift in honor of Professor Robert L. Dedrick to support the new Science and Engineering Hall.

**Alok C. Nigam, MS '90**, in recognition of the value of his degree in computer science, made a named gift to the Science and Engineering Hall. As chief technology officer at Global Infotek, Alok keeps up with SEAS initiatives in cybersecurity and appreciates the opportunity to give back.

**Nicholas (Nick) G. Paleologos, BS '69, and his wife Suellen** in continuing their commitment to helping students, have provided additional support to the Paleologos Scholarship Fund, which provides financial assistance for students working toward bachelor degrees in civil engineering.

**Charles E. Polinger, MS '76**, in appreciation for the opportunity to study at GW, has included SEAS, specifically the Dean's Fund, in his estate plans, making him a new member of GW's Heritage Society. Charles has enjoyed many of the Heritage Society activities along with SEAS events. He is a licensed mechanical engineer and real property manager with a career spanning 37 years in the facilities industry.

**Howard Tischler, MS '80, and his wife Lorraine** made a gift in support of the Science and Engineering Hall. An active volunteer leader, Howard concluded his term as the SEAS National Advisory Council chair in spring 2012, during which he played an integral role in encouraging a culture of entrepreneurship within SEAS.

**Robert W. Truland** through the **Truland Foundation** made a gift to the Science and Engineering Hall. An electrical engineering laboratory will be named in honor of his father, Walter Truland, who studied electrical engineering at SEAS in the 1930s. Robert is president of the Truland Foundation and president, CEO, and chairman of the Truland Group, Inc.

**Charles Kenneth Watt, MEA '73, D.Sc. '86**, made a named gift in support of the Science and Engineering Hall. As a long-time member of the SEAS National Advisory Council, Charles continues to provide leadership on SEAS initiatives and has actively helped in fostering a dynamic culture of entrepreneurship within the school.

DAVE SCAVONE-SCAVONE PHOTOGRAPHY



Left to right: Dean David Dolling, Charles Camarda, Donald Dinger, Amr ElSawy, Douglas Jones, Howard Tischler, Bill Westenhofer, and Provost Steven Lerman

## Hall of Fame: Living Proof of Versatility

In an evening ceremony that rivaled the warmth and cheer of the previous year's ceremony, SEAS inducted six new members into the GW Engineering Hall of Fame on October 25, 2012, spotlighting their achievements and honoring their successes. The six inductees include a former astronaut, an Academy Award® winner, a professor, a man who served in the U.S. Army Civilian Service, an entrepreneur, and the CEO of a major U.S. company.

In his opening remarks, SEAS Dean David Dolling commented on the breadth of the inductees' experiences, saying, "Recently, as I read the biographies of our 2012 inductees, I couldn't help but notice that the distinguished group of alumni we are honoring tonight is 'living proof,' as it were, of something I often tell our students. I tell them that a degree in one of the engineering disciplines or computer science opens doors to them that others can only dream of—and that this solid foundation is also surprisingly versatile. And for proof of that versatility, we can look at tonight's honorees."

**Dr. Charles Camarda, MS '80**, flew as MS-5 on the Return-to-Flight mission STS-114 Discovery, logging more than 333 hours in space from July 26 to August 9, 2005. He has received more than 21 NASA awards for technical innovations and accomplishments, and he currently serves as the senior advisor for innovation to the Office of the Chief Engineer at NASA Headquarters.

**Mr. Donald Dinger, MS '64, Applied Scientist '78**, spent his career in positions of increasing responsibility in the U.S. Army Civilian Service, where he used his engineering expertise to guide the Army in establishing and operating critical military technologies. He served in a number of leadership positions including as the director of Harry Diamond Laboratories.

**Mr. Amr ElSawy, MS '81**, is the president and CEO of Noblis, Inc. and a member of its Board of Trustees. Under his leadership, Noblis has been selected several times as one of the "50 Best Small and Mid-size Companies to Work for in America," and in 2011 it was again named one of the "World's Most Ethical" companies by the Ethisphere Institute. Also in 2011, Mr. ElSawy was named to the *Washingtonian* Tech Titan list.

**Professor Douglas Jones, BS '63, MS '65, D.Sc. '70**, has been affiliated with SEAS for more than 50 years, beginning as an undergraduate student. Over the course of his career, he taught and conducted research in solid mechanics and materials science and in mechanical engineering design. Among many other accomplishments, he also directed 25 master's theses and doctoral dissertations and helped establish a computer-aided design program in the Department of Mechanical and Aerospace Engineering.

**Mr. Howard Tischler, MS '80**, is an entrepreneur with more than 30 years of experience in software product development

and business start-ups. In 1986, he co-founded Intelus, which developed the first hospital-based electronic medical record system. He is currently the chairman and CEO of Enfoceal, an Internet-based software and marketing firm he founded in 2009.

**Mr. Bill Westenhofer, MS '95**, is an accomplished visual effects supervisor and the winner of the 2008 Academy Award® for Achievement in Visual Effects. He received the Academy Award® for his work on "The Golden Compass" and was previously nominated for an Academy Award® for his efforts on the "The Chronicles of Narnia: The Lion, the Witch and the Wardrobe" (2005).

With the addition of this year's inductees, the GW Engineering Hall of Fame now has 40 members.

## Richard Stroupe Launches SEAS Course

Thanks to the expertise and efforts of SEAS alumnus T. Richard Stroupe, Jr. (MS '01), SEAS began offering GW students a new course in entrepreneurship this fall. Stroupe created Launching Technical Ventures (SEAS 6200) to advise students who want to start their own businesses or simply learn how new businesses are created.

"Most start-ups fail due to lack of customer demand, not product development problems," warns Stroupe. "These new ventures burn through their capital, wasting money on engineering and marketing before discovering they have built a product no one wants."

Launching Technical Ventures aims to help students avoid those pitfalls by learning lean start-up management practices, developing complete business plans, and integrating their marketing and engineering functions before they try to build businesses on their own.

"Today's graduates realize how tough the job market can be, given current economic constraints and global competition," Stroupe explains. "With the support of Dean Dolling, we are able to offer LTV to not only teach our students the basics of entrepreneurship and lessons learned from other technology based startups, but also expose them to resources and frameworks that will help develop a competitive and innovative business plan and open doors

to D.C.-area venture capitalists and angel investors for possible funding opportunities.”

Stroupe, a successful entrepreneur, investor, and advisor, is the lead instructor of the new course, which meets weekly. Taking advantage of his network of business associates, he also has invited local entrepreneurs to give guest lectures throughout the semester, expanding the contacts and advice that students receive.

Launching Technical Ventures is open to all GW graduate students and senior and junior undergraduates; however, SEAS students have priority registration. While students do not receive academic credit for the course, they are finding it very useful.

“I’m learning about smart product development, financial reports, market research, and raising capital,” reports Emma Fletcher, a SEAS senior who is studying computer engineering. “I’m interested in starting my own technology company after graduation, and the course is helping me learn business skills to complement the engineering skills I’ve developed at SEAS.”



NAC Chariman Randy Graves

## National Advisory Council Update

On behalf of the entire SEAS National Advisory Council (NAC), I want to thank Howard Tischler, our outgoing NAC chairman, for his leadership and service over the past two years. He has been a strong spokesman for SEAS and a strong supporter of entrepreneurship activities at the school.

As the current chairman, I am pleased to welcome three new members to the NAC: Aran Hegarty, Sassan Kimiavi, and Gazelle Hashemian Kimiavi.

**Aran Hegarty** is a Washington, D.C.-based entrepreneur and the president of Hegarty Research. He previously served with a number of Fortune 500 companies supporting the

Department of Defense and the intelligence community. His company, Hegarty Research, was a 2012 sponsor of the SEAS Research and Development Showcase, and he served as a judge. Aran has a bachelor’s degree in electrical engineering from the University of Illinois and a master’s degree in engineering management from GW, as well as post-master’s degree studies in decision support systems.

**Sassan Kimiavi and Gazelle Hashemian Kimiavi** are also Washington, D.C.-based entrepreneurs. They are the subject of the Alumni Profile in this issue of *Synergy*, and I encourage you to read more about them, their successes, and their involvement with SEAS on page 13.

I’m also pleased to share with you some of the initiatives we discussed at the fall NAC meeting. We reviewed the SEAS entrepreneurship programs, which have made considerable progress over the past several years. Two SEAS research teams participated in the National Science Foundation’s (NSF) Innovation Corps program, and one of them won first place in the 2012 GW Business Plan Competition. You can read more about both in “Stepping Out of the Labs,” which begins on page 8. On top of this, Jim Chung, the director of GW’s Office of Entrepreneurship, reported that GW, Virginia Tech, and the University of Maryland are cooperating in a proposal to the NSF to become a teaching node for the outstanding Innovation Corp program.

Also at our fall meeting, SEAS Associate Dean for Research and Graduate Studies Can Korman reviewed the annual SEAS Research and Development Showcase and provided some important news from GW’s Office of Technology Transfer: more than 30 intellectual property filings from SEAS are currently active, and approximately one-third of those resulted from the showcase. In 2014, the showcase will be expanded to include participation by the Columbian College of Arts and Sciences as preparation for having a GW-wide technology showcase in 2015 to celebrate the opening of the new Science and Engineering Hall (SEH).

I look forward to working with the NAC’s new members and the SEAS leadership this year to strengthen the role of the NAC in supporting SEAS as it prepares for a very bright future that will be facilitated by the opening of the SEH in 2015.



## Alumni Connect with Students at Engineer Mentor Fair

GW’s Office of Alumni Relations brought 16 alumni back to campus in October to participate in the first ever SEAS Engineer Mentor Fair. Alumni “mentors” facilitated roundtable career discussions for 46 students in nine topic areas: aerospace engineering, biomedical engineering, construction, consulting, cybersecurity, energy, environmental engineering, information technology, and robotics.

Each roundtable discussion provided for 25 minutes of question-and-answer and was led by one junior alumnus and one senior alumnus, with the goal of presenting different perspectives about particular career paths. A networking session followed the four roundtable sessions.

The fair attracted both undergraduate and graduate students, who gave it very strong reviews. Miguel Alvarez, a senior in the Department of Civil and Environmental Engineering said, “I wish I could’ve attended this event as a freshman so that I could have met the individuals who gave me such great advice and encouragement for a career in engineering.”

According to Buthaina Shukri, senior associate director of SEAS alumni programs, the participating alumni also benefited from the event. “Professionals want to share their knowledge in significant ways; the mentor fair’s comfortable atmosphere allowed that,” she said.

Larry Lu, an information technology mentor and alumnus, seemed to agree, saying, “I enjoyed it as much as the students. Having an opportunity to talk to the next generation of engineers gives me satisfaction as a volunteer. I like their curiosity, passion, and desire to become engineers.”



### John Holmblad and Simon Lee Receive Alumni Awards

GW honored two SEAS alumni this year, John Holmblad (MS '80, Certificate '02) and Simon Lee (MS '05): one for outstanding service, the other for his professional achievements.

At the 51st Annual Alumni Outstanding Service Awards, held May 3, 2012, the university recognized John Holmblad for his service to GW and his community. Holmblad has been an active volunteer with SEAS since the 1990s, when he was involved in the Engineer Alumni Association (EAA) and served for many years as an active member of the judging team for the regional high school science fairs program promoted by the EAA.

Since 2011, Holmblad has served on the SEAS National Advisory Council (NAC) and is currently the chairman of the Computer Science Department's External Advisory Board. In these roles, he helps advise the school's leadership on its efforts to continue growing the department and the school. Through his involvement with the NAC, Holmblad has helped support the school's entrepreneurship initiative, as well as the university's Business Plan competition, for which he has

volunteered to serve as a mentor. He also serves as an adjunct professor in computer science, both at GW and at George Mason University.

At the 76th Annual Alumni Achievement Awards, held on September 27, 2012, GW acknowledged the professional accomplishments of another SEAS alumnus, Simon Lee. Lee emigrated from South Korea to the United States in 1979, and by 1986 he had founded Software Technology Group (STG), Inc., a premier information technology company specializing in enterprise network operations, cybersecurity, financial services, systems engineering and integration, software engineering, and linguistics and intelligence solutions. Since then, Lee has led STG to its position as one of the largest federal contractors in the region, with more than 1,300 employees, \$220 million in annual sales, and service to more than 50 major clients in approximately 250 locations worldwide.

SCHOOL OF  
ENGINEERING &  
APPLIED SCIENCE

BE A PART OF IT



Will you "Be a Part of It" with your gift to SEAS this year?

With your support last year, SEAS: sent students to national conferences, helped fund study abroad, and hosted the SEAS Student R&D Showcase. Experiences such as these complete our students' education, but they do not happen without your participation. Your gift of \$50, \$100, \$500 or any amount will help us continue to provide these opportunities and more. On behalf of our students, **THANK YOU!**

Sincerely,

David S. Dolling  
Dean

## Happenings

**William Andrews, BS (electrical engineering) '44**, has lived and worked for the past 50 years in New Hampshire. He is now retired, living beside a beautiful lake. He writes, "My class was small and WWII made us all lose contact. It would be nice to hear about any classmates." William can be reached at [andrews001@tds.net](mailto:andrews001@tds.net).

**Paige Atkins, MS (engineering administration) '89**, is the vice president for cybersecurity and research at the Virginia Tech Applied Research Corporation. With more than 28 years of government and industry experience, Paige is passionate about mentoring professionals in science and technology. She is a founding member of Women in NOVA within the Armed Forces Communications & Electronics Association. In 2011, she was awarded the Office of the Secretary of Defense Medal for Exceptional Civilian Service.



**Izaak Beekman, BS (mechanical engineering) '07**, married his long time girl friend/fiance/best friend, Janine Beha, whom he met at Colonial Inauguration and started dating his freshman year. They married on September 8, 2012, in Danbury, CT.



**Bennett Brooks, PE, MS '77**, recently completed his term as president of the National Council of Acoustical Consultants. He heads Brooks Acoustics Corporation, a consulting firm with offices in Vernon, CT, and Pompano Beach, FL. He credits his training at GW's Joint Institute with NASA Langley for helping to advance his career while he gained vital experience in engineering practice.

**Damon Coppola, MEM '03**, has written a new book, which was published earlier this fall, titled *Homeland Security: The Essentials*.

**John Froemming, MS (computer science) '11**, is a registered patent attorney and the co-leader of the Jones Day law firm's global trademark, copyright, and unfair competition practice. He can be reached at [jfroemming@jonesday.com](mailto:jfroemming@jonesday.com).



**Victoria Marie Grady, D.Sc. (engineering management) '05**, recently authored a new book, *The Pivot Point: Success in Organizational Change*, which was published in August 2012.

**Young Kim, MS (electrical engineering) '91, D.Sc. (engineering management) '99**, founded Young Enterprise Systems, Inc. in 1999. He has extensive experience in public safety and emergency management communications, and in command and control systems, and he and his team are successfully performing various complex, mission critical and large scale government programs as a prime- or a sub-contractor.

**Elliott Kugel, MS (computer science) '83**, was named in the February 20, 2012, issue of *Barron's Magazine* as one of the "Top 1,000 Advisors in America" and also was Ranked #18 in the state of New Jersey. Kugel is a senior vice president of investments at Merrill Lynch in Bridgewater, NJ, and resides in Skillman, NJ.

**Anthony Mark Lee, Applied Scientist (engineering management) '12**, works in the Office of the Secretary of Defense assessing research and engineering programs. He is considering further research opportunities since finishing his degree.



**Michael Livingston, BS (computer engineering) '92**, was recently honored for having completed eight years as the grand regent of Theta Tau Professional Engineering Fraternity. Mr. Livingston will continue

servicing the fraternity as the delegate-at-large on the executive council.

**Bradley Lytle, MS (electrical engineering) '89**, worked as an engineer for 10 years and then went on to complete his JD at American University. Now, as managing partner at Oblon Spivak, Bradley applies his engineering technical expertise to advise clients on intellectual property, patent enforcement, licensing, litigation, and a wide range of innovations.

**John McCormack, MS (engineering management) '93**, is president of Websense, Inc., a global leader in unified Web, data, and email content security. He brings a strong history of building innovative products to Websense, which won three awards in *SC Magazine* U.S. awards and the Best Security Management Award of *SC Magazine* Europe in 2012. John also holds three U.S. patents in network information acquisition and presentation.



The Society of Hispanic Professional Engineers selected **Joey Meléndez, MS (systems engineering) '09**, to receive the 2012 STAR award for Community Service. The Community Service STAR award is presented to one whose accomplishments and extraordinary efforts consistently demonstrate a sincere commitment to the goals of SHPE and the Hispanic Community. Joey is a Systems Engineer 4 at Newport News Shipbuilding, a division of Huntington Ingalls Industries, and is currently pursuing a Ph.D. in systems engineering from GW.



**Matthew Mostafaei, MS (mechanical engineering) '12**, was offered a position

with the Volkswagen Group of America almost immediately upon graduation. For the last several months, he has been working as a power train engineer at the company's California research and test center. Matthew writes, "I work with all of the Volkswagen Group vehicles, including Audis, Bentleys, Bugattis, Porsches, and Lamborghinis. I really owe a lot of my success in my career to the education I received while at GW!"

**Maj. Mike Ohleger, MEM '06**, has been deployed to Iraq twice and Afghanistan once since graduating from GW. He recently graduated from the Naval Postgraduate School with an MS in computer science, and returned to Quantico, VA, where he is working for Marine Corps Systems Command. In January 2013, he will present his paper, "Extending UAV Video Dissemination via Seamless Handover: A Proof of Concept Evaluation of the IEEE 802.21 Standard" to the 46th Hawaii International Conference on System Sciences.

**Amanda Ritsema, MEM '12**, is enjoying Charleston, South Carolina, where she is employed with the Medical University of South Carolina in the Office of University Risk Management. Amanda writes, "I miss the GW SEAS community very much but do not miss the D.C. traffic!"

**Lior Shimonovich, BS (systems engineering) '09**, is currently working at Royal Bank of Scotland in its Collateralized Loan Obligation Origination Group.



In April 2012, **Andrew Swift, D.Sc. (operations research) '01**, received an Alumni Outstanding Teaching Award from the University of Nebraska at Omaha Alumni Association in honor of distinguished teaching in the classroom. He is an assistant professor in UNO's College of Arts and Sciences.



**Stephen Voss, BA (computer science) '01, and Charlene Kannankeril, CCAS '00**, are thrilled to announce the birth of their daughter, Lena Rose. She was born on September 5, 2012, in Rockville, MD, weighing 6 lb., 12 oz. Mom, Dad and big brother Luke are enjoying their new life as a family of four at their home in Washington, D.C.

**Sean Walsh, PE, BS (mechanical engineering) '76**, is a senior naval architect at Gibbs & Cox and has been named the co-chair of the Joint Strategic Alliance Committee of the American Society of Naval Engineers (ASNE) and the Society of Naval Architects and Marine Engineers (SNAME).

**Larry Wilkerson, MS (electrical engineering) '79**, received the American Society of Naval Engineers Claud A. Jones Award in February 2012. The award citation noted that he "was a driving force behind the Coast Guard's history-making logistics modernization, transforming the Coast Guard Naval Engineering program from a regionalized mission support network to a national fleet support enterprise, harnessing over 2,700 mission support personnel into a single national logistics center supporting the entire Coast Guard Fleet worldwide." Larry retired in December 2011 after 43 years of civilian federal service to the U.S. Coast Guard as an electrical engineer, logistician, manager, and leader.

**George Willingmyre, MS (electrical engineering) '72**, is president of GTW Associates, an international standards and trade policy consultancy. Formerly he was vice president of the American National Standards Institute in Washington, D.C.

## In Memoriam

SEAS extends its condolences to the family of Dirk S. Brady, who passed away on May 22, 2012, and the family of Manouchehr (Mano) Azami-Soheily, who passed away on October 27, 2011.

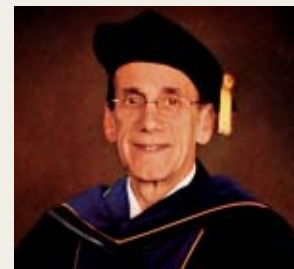


**Dirk S. Brady** entered the U.S. in 1936 as a refugee from Nazi Germany. He attended GW as a night student, graduating in 1943 with a bachelor's degree in mechanical engineering. After graduating, he entered the Merchant Marine and served as second assistant engineer.

Dirk moved to Albany, NY, where he had a long career (1946-1969) with Mohawk Brush, a division of the Fuller Brush Company. During that time he worked as a machine designer, chief engineer, plant manager, and vice-president in charge of plant management. He also was active in real estate development in Albany, owning and managing commercial buildings and apartment buildings.

Dirk began a second career in 1973 working for Ziff-Davis Publishing. He was in charge of special projects for Ziff Davis, particularly Phone Ducs, Inc., for which he served as vice-president. In more recent years he worked for Ziff Brothers Investments as a consultant.

Dirk and his wife, Judith, have been loyal contributors to GW and SEAS, with particular support of engineering scholarship programs. The family of Dirk Brady also established the Dirk Samulon Brady scholarship fund for students who have fled their home countries because of political, ethnic, or religious persecution.



**Manouchehr (Mano) Azami-Soheily, BS '79**, was a long-time and valued member of the SEAS Engineer Alumni Association and led efforts to provide judges at the local science fairs. His wife, Malak Soheily, donated Mano's scholarly works to the GW Gelman Library.

## Volunteer Opportunities

There are many ways alumni can be involved at SEAS and GW. Visit [www.alumni.gwu.edu/volunteer](http://www.alumni.gwu.edu/volunteer) or contact Buthaina Shukri at [bshukri@gwu.edu](mailto:bshukri@gwu.edu) for a complete list of volunteer opportunities.

### Engineer Alumni Association, Call for Volunteers

We are building new and dynamic alumni programming at SEAS, and we need alumni volunteers to help build those opportunities. If you are interested in participating, please contact:

**Buthaina Shukri**

**Senior Associate Director**

**School Alumni Programs**

Alumni House @ 1918 F Street, NW  
Washington, D.C.

Phone: **(202) 994-2355**

Email: [bshukri@gwu.edu](mailto:bshukri@gwu.edu)

### Career Advisor Network

Share insights with other graduates and current students seeking career assistance. Register to be a career advisor at [www.alumni.gwu.edu/networking](http://www.alumni.gwu.edu/networking).

### Programs for Students

From hosting a dinner with students to delivering a guest lecture, you have a lot to offer. Participate in a student-alumni program to build connections with current students.

### GW Alumni Association Board

The GW Alumni Association works collaboratively with the university to implement programs and services that benefit GW alumni. Board elections take place in the spring of each year.

### Young Alumni Network

The Young Alumni Network (YAN) sponsors programming and provides benefits designed to meet the social, networking, and educational needs and interests of graduates from the past 10 years. Join the dedicated recent graduates who provide the inspiration for YAN activities!

## Alumni Events

Stay connected with SEAS alumni, faculty, and current students by attending our SEAS alumni events listed below. Events are updated and added often, so be sure to visit the online alumni events calendar at [www.alumni.gwu.edu/calendar](http://www.alumni.gwu.edu/calendar) for more detailed information.

### EAA Volunteer Council: Spring Meeting

Tuesday, January 29, 2013

6:30 – 8:00 pm

Alumni House

1918 F Street, NW

### Student Research and Development Showcase

Monday, February 20, 2013

3:00 – 6:00 pm

Marvin Center

Grand Ballroom

800 21st Street, NW

### Engineering Expo

Wednesday, February 21, 2013

6:00 – 9:00 pm

Marvin Center

Continental Ballroom

800 21st Street, NW

### GW Business Plan Competition Finals and the Distinguished Entrepreneurial Achievement Award Presentation

Friday, April 19, 2013

9:30 am – 6:30 pm

Duquès Hall

6th Floor

2201 G Street, NW

### Pelton Senior Design Competition and Senior-Alumni BBQ

Wednesday, May 15, 2013

5:00 pm: Pelton Competition

6:30 pm: Senior-Alumni BBQ

Marvin Center

Grand Ballroom

800 21st Street, NW

**THE GEORGE  
WASHINGTON  
UNIVERSITY**

WASHINGTON, DC

**School of Engineering & Applied Science  
The George Washington University**

Tompkins Hall  
725 23rd Street, NW  
Washington, D.C. 20052

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### **GW SERVICES**

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Services  
202-994-6158

Adina Lav  
Director  
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202-994-6158

### **ACADEMIC PROGRAMS**

**Applied Science & Technology**  
202-994-7541  
[www.emse.gwu.edu](http://www.emse.gwu.edu)

**Biomedical Engineering**  
202-994-6083  
[www.ece.gwu.edu](http://www.ece.gwu.edu)

**Civil & Environmental Engineering**  
202-994-4901  
[www.cee.seas.gwu.edu](http://www.cee.seas.gwu.edu)

### **Computer Engineering**

202-994-6083  
[www.ece.gwu.edu](http://www.ece.gwu.edu)

### **Computer Science**

202-994-7181  
[www.cs.gwu.edu](http://www.cs.gwu.edu)

### **Cybersecurity**

202-994-7181  
[www.cs.gwu.edu](http://www.cs.gwu.edu)

### **Electrical Engineering**

202-994-6083  
[www.ece.gwu.edu](http://www.ece.gwu.edu)

### **Engineering Management**

202-994-7541  
[www.emse.gwu.edu](http://www.emse.gwu.edu)

### **Mechanical & Aerospace Engineering**

202-994-6749  
[www.mae.seas.gwu.edu](http://www.mae.seas.gwu.edu)

### **Systems Engineering**

202-994-7541  
[www.emse.gwu.edu](http://www.emse.gwu.edu)

### **Telecommunications & Computers**

202-994-6083  
[www.ece.gwu.edu](http://www.ece.gwu.edu)