# Ontology-based Recognition of Folktale Characters

Nikolina Koleva

Thierry Declerck

Workflow for Ontology-Based detection of Characters in Folktales
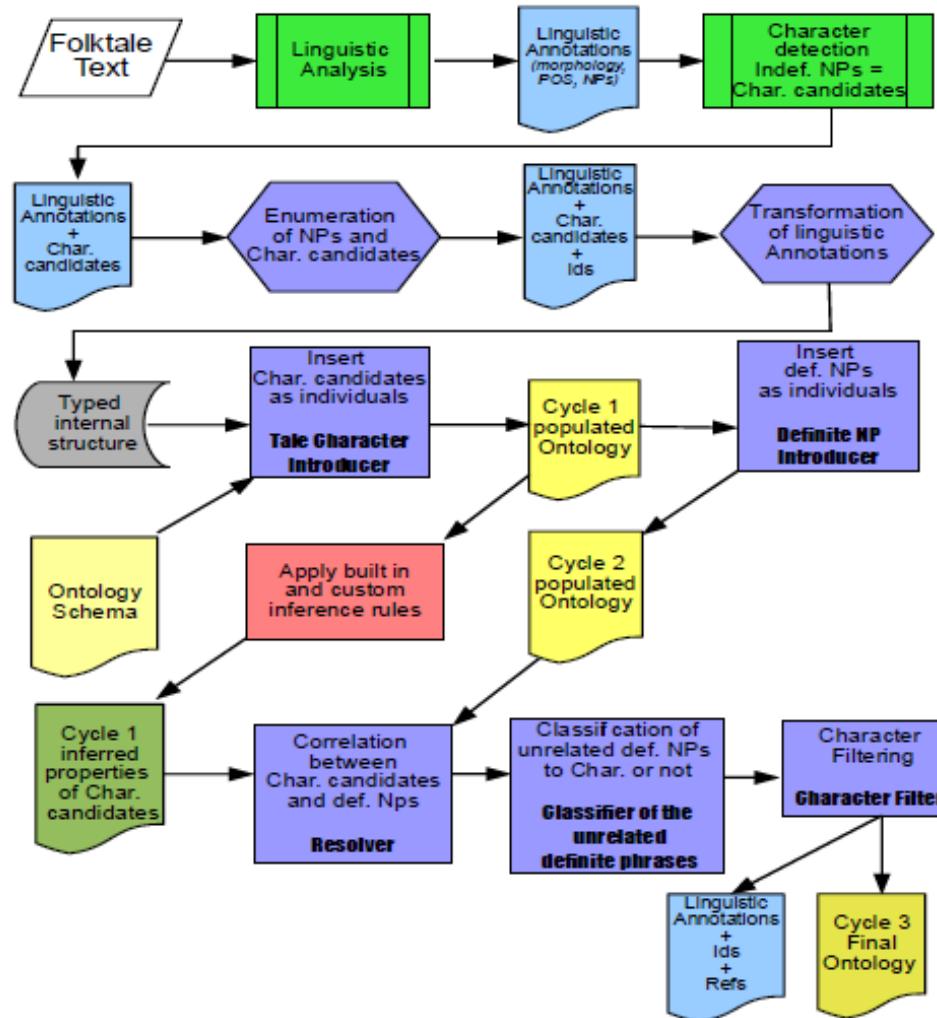
Linguistic Analysis

- <text>
- <s id="S1" tokstart="tok1" tokend="tok17">
- **<clause id="C1" tokstart="tok1" tokend="tok9">**
- <w pos="EX" id="tok1">There</w>
- <w pos="VBD" id="tok2">lived</w>
- **<chunk cat="NP" id="ph1" tokstart="tok3" tokend="tok9">**
- <chunk cat="NP" id="ph2" ref="ch1" tokstart="tok3" tokend="tok5">
- <w pos="DT" id="tok3">an</w>
- <w pos="JJ" id="tok4">old</w>
- <w pos="NN" id="tok5">man</w>
- </chunk>
- <w pos="CC" id="tok6">and</w>
- <chunk cat="NP" id="ph3" ref ="ch2" tokstart="tok7" tokend="tok9">
- <w pos="DT" id="tok7">an</w>
- <w pos="JJ" id="tok8">old</w>
- <w pos="NN" id="tok9">woman</w>
- </chunk>
- **</chunk>**
- **</clause>**
- <w pos="$PUNCT" >;</w>

- **<clause id="C2" tokstart="tok10" tokend="tok17">**
- <w pos="PRP" id="tok10" **ref="ph1"**>they</w>
- <w pos="VBD" id="tok11">had</w>
- <chunk cat="NP" id="ph4" tokstart="tok12" tokend="tok17">
- <chunk cat="NP" id="ph5" ref="ch3" tokstart="tok12" tokend="tok13">
- <w pos="DT" id="tok12">a</w>
- <w pos="NN" id="tok13">daughter</w>
- </chunk>
- <w pos="CC" id="tok14">and</w>
- <chunk cat="NP" id="ph6" ref ="ch4" tokstart="tok15" tokend="tok17">
- <w pos="DT" id="tok15">a</w>
- <w pos="JJ" id="tok16">little</w>
- <w pos="NN" id="tok17">son</w>
- </chunk>
- </chunk>
- **</clause>**
- <w pos="$.">.</w>
- </s>
- </text>

Family Relations in the Ontology (Class Hierarchy)

Family Relations in the Ontology (Class Hierarchy)

Definition and use of inference rules

- hasParent(?x, ?x1), hasParent(?x, ?x2), hasParent(?y, ?x1), hasParent(?y,?x2), hasGender(?x, "f"), notEqual(?x, ?y) => Sister(?x)

- Daughter(?d) , Father(?f) , Son(?s) => hasBrother(?d, ?s), hasChild(?f,?s),hasChild(?f,?d), hasSister(?s, ?d)

(Object) Properties in the Family Ontology

First Ontology Population (looking for indefinite NPs)

Merging (reference resolution) with Information from Indefinite NPs
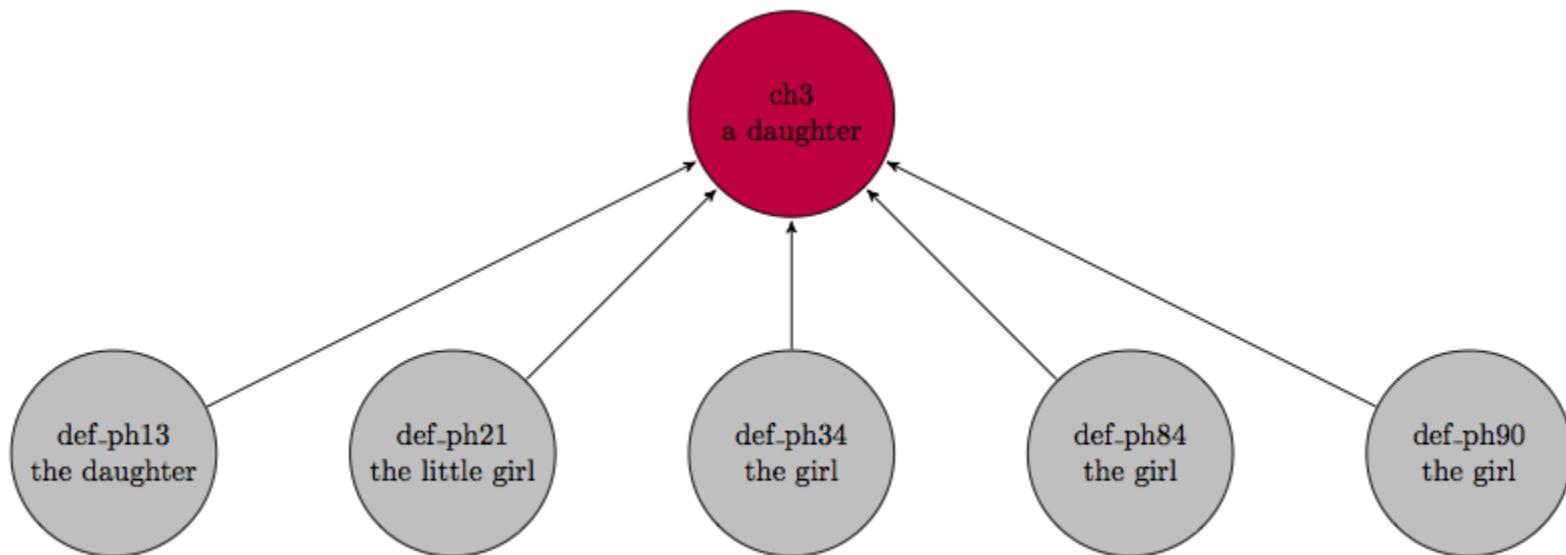
Second Stage of the Ontology Population (Character 3)

Integrated Ontologies for the Classification of Folktales

Thierry Declerck, DFKI GmbH

Antónia Koštová, Lisa Schäfer, Saarland University

Background

- Series of student projects on the topic: „Classification of Folktales: Building and Querying an Ontology with Folktales Classifications". Goals: To design software that:
  - Could take any given folktale, and display a list of categories to which this folktale belongs.
  - Recognize "motifs" in use in the folktales
- Prerequisite: Formalization of classification schemes used by folklorists

2 Classification schemes

- Two well-known classification systems used by folklorists:
  - TMI - Thompson-Motif-Index of Folk-Literature
  - ATU - Aarne-Thompson-Uther classication of tale types

- Both of them are available as printed sources, or as online resources in html or pdf format. Since the two systems are related to each other, our aims are to:
  1. organize them in one ontology with appropriate references,
  2. make the resulting ontology available online,
  3. *implement a web interface for SPARQL querying, and*
  4. *implement an automatic classifier of texts based on statistical approach.*

TMI
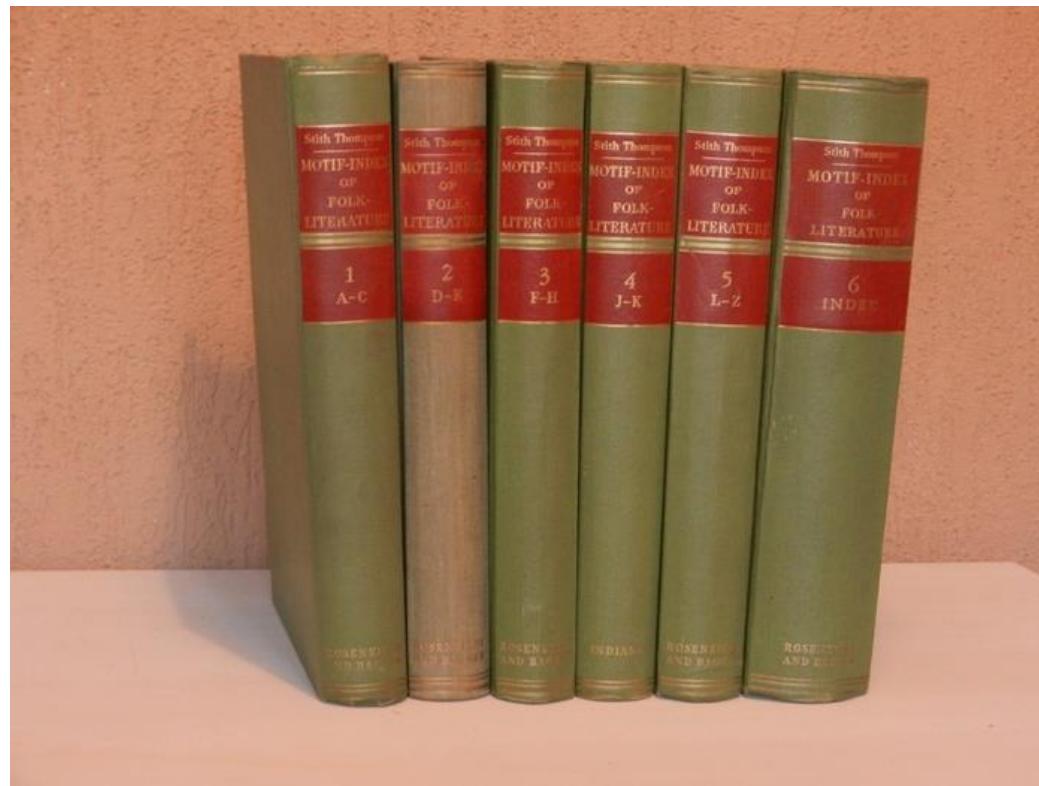
S. Thompson. Motif-index of folk-literature : a classification of narrative elements in folktales, ballads, myths, fables, medieval romances, exempla, fabliaux, jest-books, and local legends.
Revised and enlarged. edition. Bloomington : Indiana University Press, 1955-1958. S. Thompson. Motif-index of folk-literature : a classification of narrative elements in folktales, ballads, myths, fables, medieval romances, exempla, fabliaux, jest-books, and local legends.

Revised and enlarged. edition. Bloomington : Indiana University Press, 1955-1958

TMI

https://sites.ualberta.ca/~urban/Projects/English/Motif_Index.htm

A search Engine for TMI + WordNet MOMFER (http://www.momfer.ml/)

ATU

HANS-JÖRG UTHER

The Types of International Folktales

A Classification and Bibliography

Part I
ANIMAL TALES, TALES OF MAGIC,
RELIGIOUS TALES, and REALISTIC TALES,
with an INTRODUCTION

ACADEMIA SCIENTIARUM FENNICA
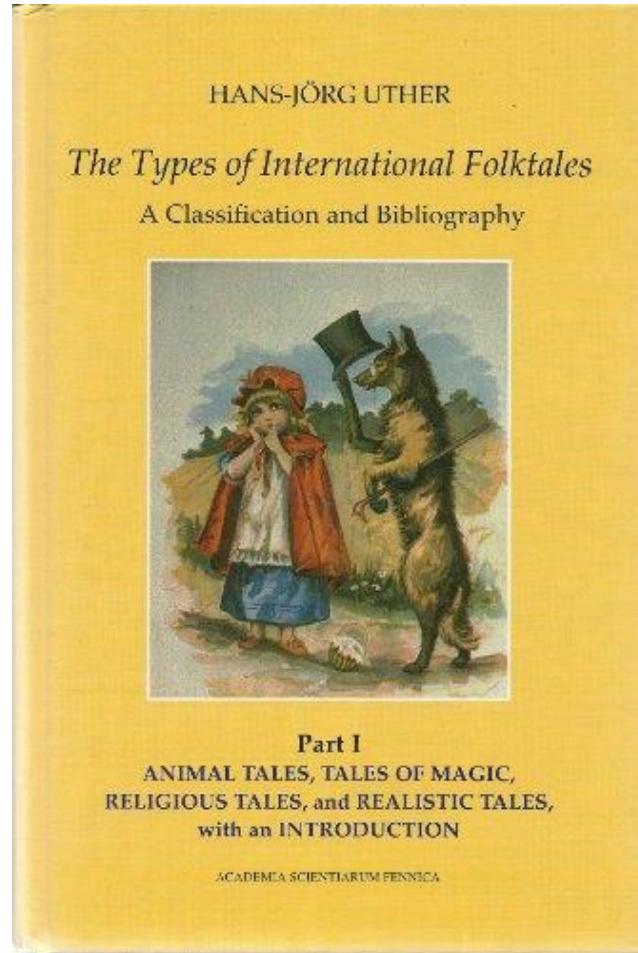
On-Line Multilingual ATU
http::/mftd.org

Multilingual Folk Tale Database

Home • Browse Stories • Classification • login

Aarne-Thompson-Uther Classification of Folk Tales

There are many different folk tales in the world, but many tales are variations on a limited number of themes. The classification s
Thompson and later by Uther, is intended to bring out the similarities between tales by grouping variants of the same tale under t

Below is the full tree of the ATU classification. Click on a title to see all the stories within that class.

- ANIMAL TALES   1-299
    - Wild Animals   1-99
        - The Clever Fox (Other Animal)   1-69
        - Other Wild Animals   70-99
    - Wild Animals and Domestic Animals   100-149
    - Wild Animals and Humans   150-199
    - Domestic Animals   200-219
    - Other Animals and Objects   220-299
- TALES OF MAGIC   300-749
    - Supernatural Adversaries   300-399
    - Supernatural or Enchanted Wife (Husband) or Other Relative   400-459
        - Wife   400-424
        - Husband   425-449
        - Brother or Sister   450-459
    - Supernatural Tasks   460-499
    - Supernatural Helpers   500-559
    - Magic Objects   560-649

On-Line Multilingual ATU (2) http::/mftd.org

Multilingual Folk Tale Database

Search

Лисичка-сестричка и волк

Александр Афанасьев

Жил себе дед да баба. Дед говорит бабе: «Ты, баба, пеки пироги, а я поеду за рыбой». Наловил рыбы и везет домой целый воз. Вот едет он и видит: лисичка свернулась калачиком и лежит на дороге. Дед слез с воза, подошел к лисичке, а она не ворохнется, лежит себе как мертвая. «Вот будет подарок жене», — сказал дед, взял лисичку и положил на воз, а сам пошел впереди. А лисичка улучила время и стала выбрасывать полегоньку из воза все по рыбке да по рыбке, все по рыбке да по рыбке. Повыбросала всю рыбу, и сама ушла.

«Ну, старуха, — говорит дед, — какой воротник привез я тебе на шубу». — «Где?» — «Там, на возу, — и рыба и воротник». Подошла баба к возу: ни воротника, ни рыбы, и начала ругать мужа: «Ах ты, старый хрен! Такой-сякой! Ты еще вздумал обманывать!» Тут дед смекнул, что лисичка-то была не мертвая; погоревал, погоревал, да делать-то нечего.

А лисичка собрала всю разбросанную по дороге рыбу в кучку, села и ест себе. Навстречу ей идет волк: «Здравствуй, кумушка!» — «Здравствуй, куманек!» — «Дай мне рыбки!» — «Налови сам, да и ешь». — «Я не умею». — «Эка, ведь я же наловила; ты, куманек, ступай на реку, опусти хвост в прорубь — рыба сама на хвост нацепляется, да смотри, сиди подольше, а то не наловишь».

Волк пошел на реку, опустил хвост в прорубь; дело-то было зимою. Уж он сидел, сидел, целую ночь просидел, хвост его и приморозило; попробовал было приподняться: не тут-то было. «Эка, сколько рыбы привалило, и не вытащишь!» — думает он. Смотрит, а бабы идут за водой и кричат, завидя серого: «Волк, волк! Бейте его! Бейте его!» Прибежали и начали колотить волка — кто коромыслом, кто ведром, чем кто попало. Волк прыгал-прыгал, оторвал себе хвост и пустился без оглядки бежать. «Хорошо же, — думает, — уж я тебе отплачу, кумушка!»

А лисичка-сестричка, покушамши рыбки, захотела попробовать, не удастся ли еще что-нибудь стянуть; забралась в одну избу, где бабы пекли блины, да попала головой в кадку с тестом, вымазалась и бежит. А волк ей навстречу: «Так-то учишь ты? Меня всего исколотили!» — «Эх, куманек, — говорит лисичка-сестричка, — у тебя хоть кровь выступила, а у меня мозг, меня больней твоего прибили; я насилу плетусь». — «И то правда, — говорит волк, — где тебе, кумушка, уж идти; садись на меня, я тебя довезу». Лисичка села ему на спину, он ее и понес. Вот лисичка-сестричка сидит, да потихоньку и говорит: «Битый небитого везет, битый небитого везет». — «Что ты, кумушка, говоришь?» — «Я, куманек, говорю: битый битого везет». — «Так, кумушка, так!»

«Давай, куманек, построим себе хатки». — «Давай, кумушка!» — «Я себе построю лубяную, а ты себе ледяную». Принялись за работу, сделали себе хатки: лисичке — лубяную, а волку — ледяную, и живут в них. Пришла весна, волчья хатка и растаяла. «А, кумушка! — говорит волк. — Ты меня опять обманула, надо тебя за это съесть». — «Пойдем, куманек, еще поконаемся, кому-то кого достанется есть». Вот лисичка-сестричка привела его в лес к глубокой яме и говорит: «Прыгай! Если ты перепрыгнешь через яму — тебе меня есть, а не перепрыгнешь — мне тебя есть». Волк прыгнул и попал в яму. «Ну, — говорит лисичка, — сиди же тут!» — и сама ушла.

Идет она, несет скалочку в лапках и просится к мужичку в избу: «Пусти лисичку-сестричку переночевать». — «У нас и без тебя тесно». — «Я не потесню вас; сама лягу на лавочку, хвостик под лавочку, скалочку под печку». Ее пустили. Она легла сама на лавочку, хвостик под лавочку, скалочку под печку. Рано поутру лисичка встала, сожгла свою скалочку, а после спрашивает: «Где же моя скалочка? Я за нее и гусочку не возьму!» Мужик — делать нечего — отдал ей за скалочку гусочку; взяла лисичка гусочку, идет и поет:

И шла лисичка-сестричка по дорожке,

Несла скалочку;

За скалочку — гусочку!

Стук, стук, стук! — стучится она в избу к другому мужику. «Кто там?» — «Я — лисичка-сестричка, пустите переночевать». — «У нас и без тебя тесно». — «Я не потесню вас; сама лягу на
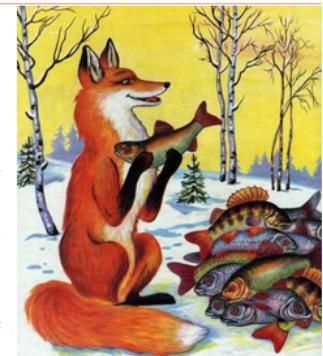
Information

Author: Александр Афанасьев - 1855

Original version in Russian

Source: Народные Русские Сказки (nr. 001)

Country of origin: Russia

Story type: The theft of fish (ATU 1)

Translations

There are no translations available for this story

Add a translation

ATU Textfile

- *1 The Theft of Fish*. (Including the previous Types 1* and 1**.) A fox (hare, rabbit, coyote, jackal) lies in the road pretending to be dead. A fisherman throws him on his wagon which is full of fish (cheese, butter, meat, bread, money). The fox throws the fish out of the wagon [K371.1] and jumps down after them [K341.2, K341.2.1].

- A wolf (bear, fox, coyote, hyena) tries to imitate this and pretends to be dead, too. The fisherman catches him and beats him [K1026]. Cf. Types 56A, 56B, and 56A*.

- In some variants one animal (rabbit, fox) pretends to be dead in order to distract a man who is carrying a basket of food. Another animal (fox, wolf) steals the basket. (Previously Type 1*, cf. Type 223.) Or an animal makes a hole in the basket so that the contents fall out. (Previously Type 1**.)

TMI vs ATU

Thompson-Motif-Index

Motif is a repeated story element, e.g., a character, An object, an action, or an event.

- smaller units
- organized in hierarchical structure

Aarne-Thompson-Uther Types

Type is a main story line that can be found in several cultures.

- bigger units
- parts of type descriptions refer to motifs

Transforming TMI and ATU into an integrated Ontology

- Preprocessing TMI and ATU Text

HTML format →RE→ line database
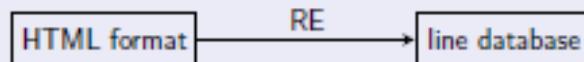
Output:

Motif-id	Motif name
A	Mythological motifs
A1	Identity of creator
A1.1	Sun-god as creator
A1.2	Grandfather as creator
A1.3	Stone-woman as creator
A1.4	Brahma as creator
A2	Multiple creators

text format →RE→ line database

Output format:
[ATU number]~[ATU Title]~[ATU Description]~[List of references to TMIs, separated by commas]

Example:
130~The Animals in Night Quarters~The Animals in Night Quarters. (Bremen Town Musicians.) Donkey, dog, cat and rooster are ill-treated by their owners because they... ~[B296,N776,K335.1.4,K1161]

Creating the Ontology for TMI and ATU

[ATU_number]∼[ATU_Title]∼[ATU_Description]
∼[List of references to TMIs]

Motif-id	Motif name
A	Mythological motifs
A1	Identity of creator
A1.1	Sun-god as creator
A1.2	Grandfather as creator
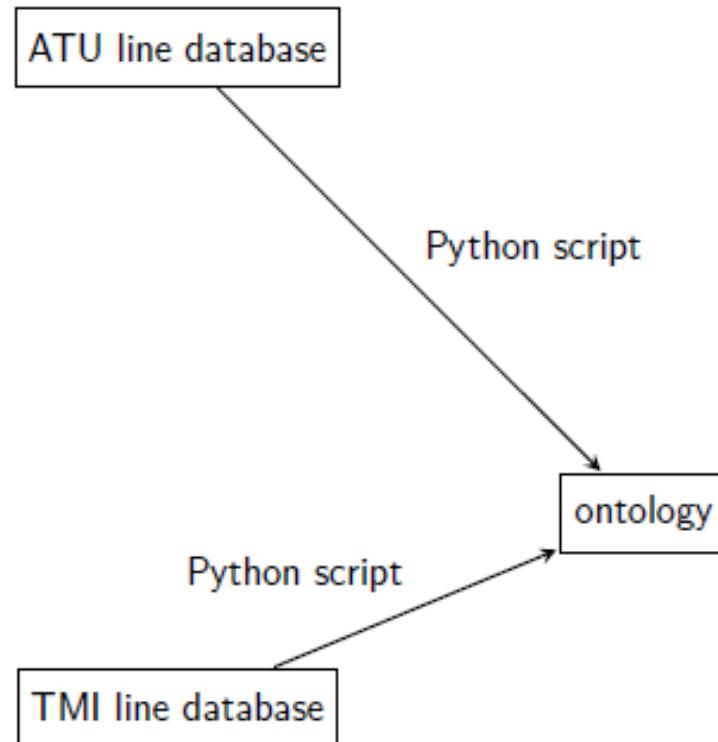
Ontology for TMI and ATU -- Structure
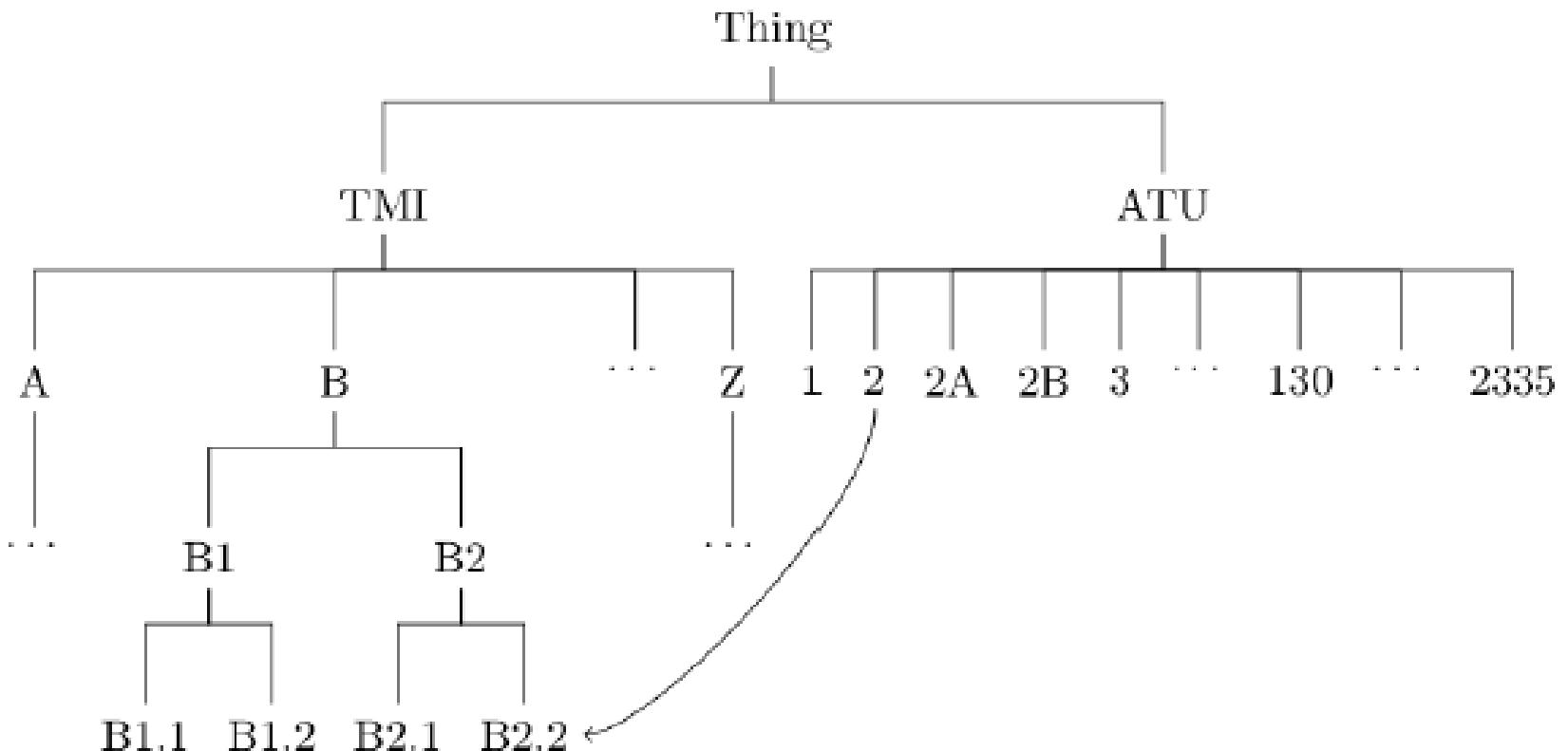
Example of two ontology class entries in RDF(s) Syntax
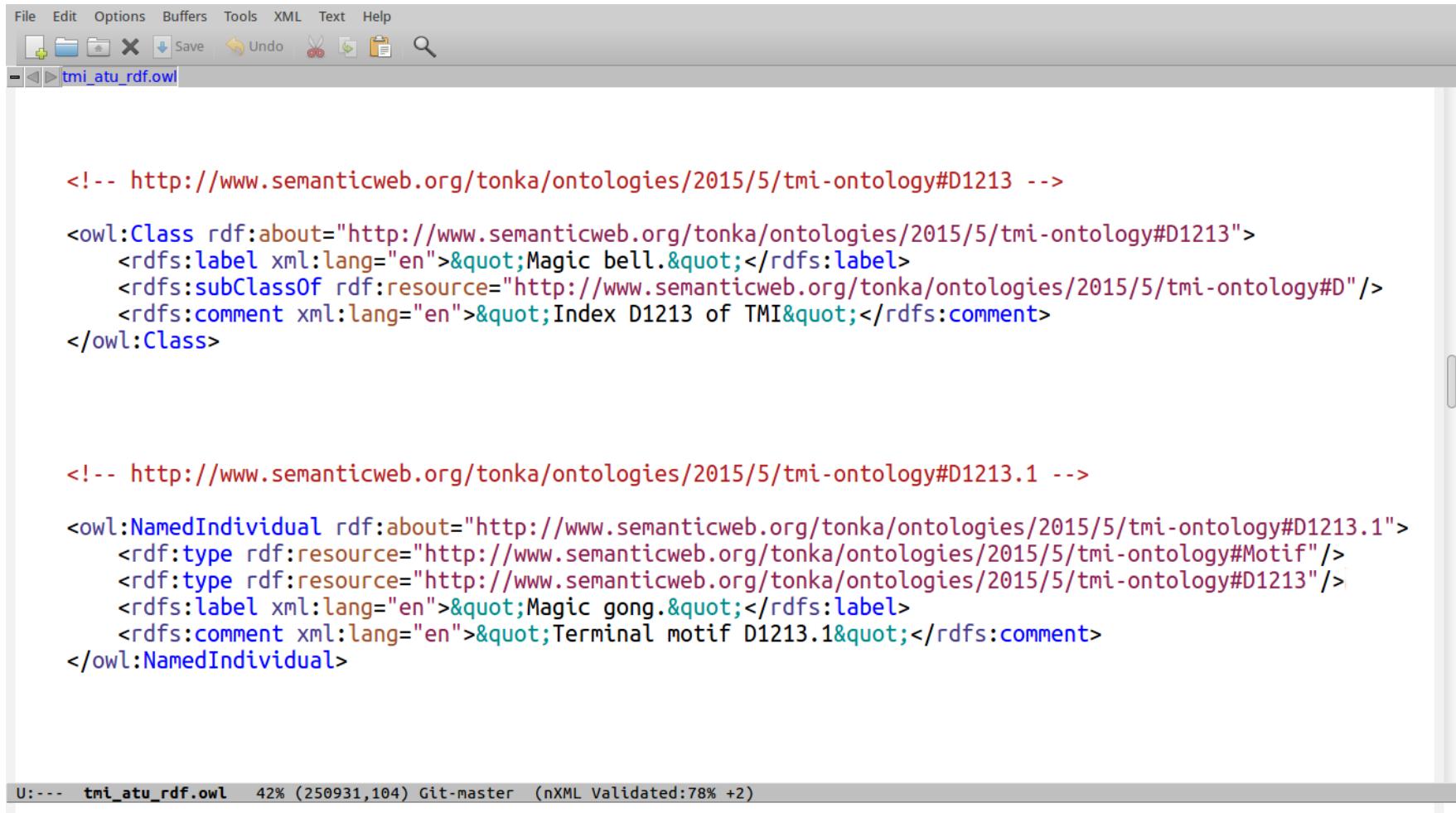
```
<!-- http://www.semanticweb.org/tonka/ontologies/2015/5/tmi-ontology#D1213 -->

<owl:Class rdf:about="http://www.semanticweb.org/tonka/ontologies/2015/5/tmi-ontology#D1213">
    <rdfs:label xml:lang="en">&quot;Magic bell.&quot;</rdfs:label>
    <rdfs:subClassOf rdf:resource="http://www.semanticweb.org/tonka/ontologies/2015/5/tmi-ontology#D"/>
    <rdfs:comment xml:lang="en">&quot;Index D1213 of TMI&quot;</rdfs:comment>
</owl:Class>


<!-- http://www.semanticweb.org/tonka/ontologies/2015/5/tmi-ontology#D1213.1 -->

<owl:NamedIndividual rdf:about="http://www.semanticweb.org/tonka/ontologies/2015/5/tmi-ontology#D1213.1">
    <rdf:type rdf:resource="http://www.semanticweb.org/tonka/ontologies/2015/5/tmi-ontology#Motif"/>
    <rdf:type rdf:resource="http://www.semanticweb.org/tonka/ontologies/2015/5/tmi-ontology#D1213"/>
    <rdfs:label xml:lang="en">&quot;Magic gong.&quot;</rdfs:label>
    <rdfs:comment xml:lang="en">&quot;Terminal motif D1213.1&quot;</rdfs:comment>
</owl:NamedIndividual>
```

Ontology Visualization (2)

Ontology Visualized in Protégé

Towards a WordNet based Classification of Actors in Folktales

Thierry Declerck, DFKI GmbH

Tyler Klement, *Antónia Koštová*
Saarland University

Goal of the use of WordNet

- Investigating how WordNet can be used for identifiying similar elemens in different (formalized) classification schemes (topic of the current presentation

- Detect similar characters/actors within and across the tale classification systems.

Input Data for WordNet Analysis

- *2   The Tail-Fisher*. **A bear (wolf)** meets a fox who has caught a big load of fish. He asks him where he caught them, and the fox replies that he was fishing with his tail through a hole in the ice. He advises the bear to do likewise and the bear does. When the bear tries to pull his tail out of the ice (because men or dogs are at-tacking him), it is frozen in place. He runs away but leaves his tail behind [K1021]. Cf. Type 1891.

- Combinations: This type is usually combined with epi-sodes of one or more other types, esp. 1, 3, 4, 5, 8, 15, 41, 158, and 1910.

Input Data for WordNet Analysis – Pre-processed for machine reading

- 6~Animal Captor Persuaded to Talk.~ A fox (jackal, wolf) catches a chicken (crow, bird, hyena, sheep, etc.) and is about to eat it. The weak animal asks a question and the fox answers. Thus he releases the prey and it escapes. ~K561.1

Use NLTK for accessing WN

- Searching for the least common hypernym (LCH) for the two words used in the pattern "A/An Noun (Noun):
  - Synset(man.n.01), Synset(fox.n.05) => LCH(Synset(person.n.01))
  - Synset(fox.n.01), Synset(jackal.n.01) => LCH(Synset(canine.n.02))
  - Synset(fox.n.01), Synset(cat.n.01) => LCH(Synset(carnivore.n.01))
  - Synset(raven.n.01), Synset(crow.n.01) => LCH(Synset(corvine_bird.n.01))

Filtering out LCH results?

- Is "Synset(man.n.01), Synset(fox.n.05) => LCH(Synset(person.n.01))" not delivering a too generic synset?

- Testing the the NLTK function "path_similarity" for filering out:

  - "man.n.01" and "fox.n.05: '0.2'

  - "fox.n.01" and "jackal.n.01" : '0.33'

  - O.33 as a threshold for selecting a hypernym?

Flitering (2)

- filtering out the selected hypernym on the basis of the length of the path leading from it to the root node. The LCH "canine.n.02" has a much longer path to "entity" as does the LCH "person.n.01".

  – Is "canine" then more appropriate for a precise detection of character similarities across classification systems?

Extending the term base via the NLTK hyponym search

- synset "overlord.n.01"
  - hyponyms "feudal_lord", "seigneur" and "seignior",
- But "fox.n.01"
  - "Urocyon_cinereoargenteus" or "Vulpes_fulva"
  - Are such scientific names useful for the task at hand`? Still: it allows to link to another type of literature.

NLTK function for generating multilingual equivalents (for example: FR)

- Synset('fox.n.01') ::Synset('wolf.n.01') :: ['renard'] and ['loup', 'louve']

- Synset('dragon.n.02')::Synset('monster.n.04') :: ['dragon'] and ['démon', 'monstre', 'diable', 'Diable']

- "Synset('enchantress.n.02')::Synset('sorceress.n.01') :: ['sorcière'] and ['enchanteur', 'ensorceleur', 'sorcière']

Cooperation with the BMBF Project: eTRAP – Digital Breadcrumbs of Brothers Grimm, Göttingen
http://www.etrap.eu/digital-breadcrumbs-of-brothers-grimm/

Integration of SnowWhite-Motif-Matrix into TMI-ATU-Ontology

Lisa Schäfer & Thierry Declerck

05.04.2017

Basic Framework

- Integration based on W3C standards: owl, rdfs, skos and skos-xl; and of Dublin Core (dc)

- dc for **annotation properties** (dc:title, dc:creator, dc:date, dc:source, dc:rights)

- skos and skos-xl for integrating the **words representing a motif** in a fairytale (skosxl:Label)

Extension of Ontology

- Introducing of **new classes**:
  - ➤ **Tale** for specific fairy tales as representations (or instance) of an ATU type
  - ➤ **Tale collection** for the collection the specific tale is published in
  - ➤ **eTRAP_Motif** for all motifs introduced by the eTRAP-project (marked by preceding "e") and for the terminal TMI motifs that became classes
  - ➤ Built-in **skosxl:Label** for representing the content of the cells of the matrix

Mapping from Matrix to Ontology (I)

1. The fairy tales

Concrete Tale as instance of class **Tale**; name = "title_author_year"

GER
Grimm_1812 VIAF: 1874449723
Sneewittchen

Class hierarchy: Tale

- ▼ owl:Thing
  - ▶ **AaTh**
  - ▶ **ATU**
  - ▶ **eTRAP_Motif**
  - ▶ **Motif**
  - rdf:List
  - ▶ skos:Collection
  - skos:Concept
  - skos:ConceptScheme
  - skosxl:Label
  - **Tale**

Instances: Sneewittchen_Grimm_1812

For: ● Tale

- ◆ **Gold-Tree_and_Silver-Tree_Jacobs_1892**
- ◆ **Schneewittchen_Hahn_1864**
- ◆ **Sneewittchen_Grimm_1812**
- ◆ **Sneewittchen_Grimm_1819**
- ◆ **Sneewittchen_Grimm_1837**

Mapping from Matrix to Ontology (II)

1. The fairy tales

Information as **dc** annotation properties

```
:Sneewittchen_Grimm_1812 a
owl:NamedIndividual , :Tale ; […]
        dc:creator "Grimm"@en ;
        dc:date "1812"^^xsd:integer ;
        dc:language "ger" ;
        dc:rights "*tba*"@en ;
        dc:source "*tba*"@en ;
        dc:title "Sneewittchen "@de .
```

GER
Grimm_1812 VIAF: 187449723
Sneewittchen

Annotations | Usage

Annotations: Sneewittchen_Grimm_1812

Annotations ➕

dc:title [language: de]

Sneewittchen

dc:rights [language: en]

tba

dc:creator [language: en]

Grimm

dc:date [type: xsd:integer]

1812

dc:language

ger

dc:source [language: en]

tba

Mapping from Matrix to Ontology (III)

1. The fairy tales

Connection to **ATU type** via two inverse object properties: **represents** and **isRepresentedBy**

Property assertions: Sneewittchen_Grimm_1812

represents 709

Property assertions: 709

isRepresentedBy Sneewittchen_Grimm_1812

```
:709 a owl:NamedIndividual , :Type ;
        :isRepresentedBy
:Sneewittchen_Grimm_1812 , […] :Snow-
Drop_Taylor_1823 […] ;
        :linkToTMI :D1311.2 , […] .

:Sneewittchen_Grimm_1812 a
owl:NamedIndividual , :Tale ; […]
        :represents :709 […] .
```

Mapping from Matrix to Ontology (IV)

1. The fairy tales

- Connection to fairy tale **collection** via object property **partOfCollection** and inverse **hasPart**

- Collections as instances of class **Tale_collection**; name = "author_year"

Annotations: Grimm_1812

Annotations

dc:title [language: de]

tba

dc:rights [language: en]

tba

dc:creator [language: en]

Grimm

dc:date [type: xsd:integer]

1812

dc:language

de

dc:source [language: en]

tba

Tale
Tale_collection

Instances: Grimm_1812

For: ● Tale_collection

- **Briggs_1970**
- **Calvino_1956**
- **Campbell_1958**
- **Grimm_1812**

Property assertions: Grimm_1812

Object property assertions

■ **hasPart Sneewittchen_Grimm_1812**

Property assertions: Sneewittchen_Grimm_1812

■ **partOfCollection Grimm_1812**

```
:Sneewittchen_Grimm_1812 a
owl:NamedIndividual , :Tale ; […]
         :partOfCollection
:Grimm_1812 ; […].
```

Mapping from Matrix to Ontology (V)

2. The motifs

- Inserting of newly introduced motifs as instances of class **eTRAP_Motif**
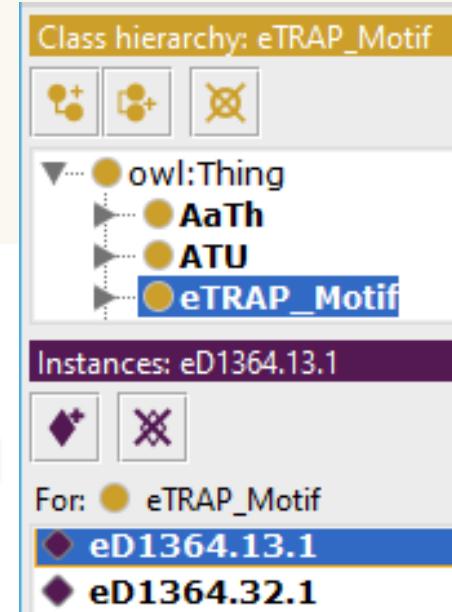
Mapping from Matrix to Ontology (VI)

3. Connection between fairy tales and motifs

- Realized by two object properties that are inverse to each other:

  - **containsMotif** for the linking from the concrete fairy tale to all motifs that it contains

  - **appearsInTale** for the linking from a motif to all fairy tales in which it appears

```
:Sneewittchen_Grimm_1812 a owl:NamedIndividual , :Tale ;
        :containsMotif :D1163 , :D1163 , :D1310 , :D1311 , :D1311.2 , :D1364
, :D1364.13 , :D1364.4 , :D1364.4.1 , :D1364.9 , :D1610 , […] ,:eZA7 ; […].

T10 a owl:NamedIndividual , :Motif , :T ; […]
        :appearsInTale :Bella_Venezia_Calvino_1956 , :Sneewittchen_Grimm_1812
, […] :Сказка_о_мертвой_царевне_и_о_семи_богатырях_Pushkin_1833 .
```

Mapping from Matrix to Ontology (VII)

3. Connection between fairy tales and motifs

Property assertions: Sneewittchen_Grimm_1812

Object property assertions ⊕

- containsMotif E21.3
- containsMotif eS322.2.4
- containsMotif T16.2
- containsMotif Q211.4
- containsMotif P322
- containsMotif eD1610.37
- containsMotif W195
- containsMotif eZA101
- containsMotif E422.1
- containsMotif Q414.4
- containsMotif eR131.1.1
- containsMotif eS119

Property assertions: E21.3

Object property assertions ⊕

- appearsInTale Sneewittchen_Grimm_1840
- appearsInTale Sneewittchen_Grimm_1843
- appearsInTale Snow-Drop_Taylor_1823
- appearsInTale Sneewittchen_Grimm_1850

Description: containsMotif

Equivalent To ⊕

SubProperty Of ⊕

- owl:topObjectProperty

Inverse Of ⊕

- appearsInTale

Mapping from Matrix to Ontology (VIII)

4. ## Inserting the words per motif

- Realized by skosxl:Label

- For every motif **one skosxl:prefLabel** and several **skosxl:altLabel** for every "verbalization" of the motif in a certain fairy tale

- **prefLabel**: the TMI or eTRAP motif itself

- **altLabel**: the "verbalization" of the motif, words accessible as value of data property **skosxl:literalForm**

Mapping from Matrix to Ontology (IX)

4. Inserting the words per motif

- labels assigned via object properties **prefLabel** and **altLabel**

- labels themselves are instances of class **skosxl:label**

- connection between **prefLabel** as basic motif and **altLabels** as "realisations" of this motif via two inverse object properties as sub-properties of **skosxl:labelRelation**: **verbalizes** and **verbalizedAs**

Mapping from Matrix to Ontology (X)

4. Inserting the words per motif

- Example: Motif T16.2

- Label assertions and their classification as skosxl:label

Instances:

For: ● skosxl:Label

◆ **T16.2**
◆ T16.2_s_1812
◆ T16.2_s_1819
◆ T16.2_s_1823

Annotations | Usage

Annotations: T16.2

Annotations ⊕

rdfs:label [language: en]

"Man falls in love on seeing dead body of beautiful girl."

rdfs:comment [language: en]

"Terminal motif T16.2"

Object property assertions ⊕

▪ skosxl:prefLabel **T16.2**
▪ appearsInTale **Sneewittchen_Grimm_1850**
▪ skosxl:altLabel **T16.2_s_1958**
▪ skosxl:altLabel **T16.2_s_1850**
▪ skosxl:altLabel **T16.2_s_1840**
▪ skosxl:altLabel **T16.2_s_1956**
▪ skosxl:altLabel **T16.2_s_1843**

4. Inserting the words per motif

- Example: Motif T16.2

```
:T16.2 a owl:NamedIndividual , :Motif , :T16 ;
        skosxl:prefLabel
<http://www.semanticweb.org/tonka/ontologies/2015/5/tmi-
atu-ontology/label#T16.2> ;
        skosxl:altLabel
<http://www.semanticweb.org/tonka/ontologies/2015/5/tmi-
atu-ontology/label#T16.2_s_1812> ,
<http://www.semanticweb.org/tonka/ontologies/2015/5/tmi-
atu-ontology/label#T16.2_s_1819> , […]
<http://www.semanticweb.org/tonka/ontologies/2015/5/tmi-
atu-ontology/label#T16.2_s_1970> ; […] .
```

Mapping from Matrix to Ontology (XII)

4. Inserting the words per motif

- Example: Motif T16.2
- PrefLabel

Annotations: T16.2

Annotations ➕

dc:creator [language: en]
Stith Thompson

rdfs:comment [language: en]
The original label for motif T16.2

dc:source [language: en]
TMI - Motif-Index of Folk-Literature (1955–1958)

skosxl:verbalizedAs
◆ T16.2_s_1812

skosxl:verbalizedAs
◆ T16.2_s_1819

Property assertions: T16.2

Object property assertions ➕

Data property assertions ➕

▪ skosxl:literalForm "Man falls in love on seeing dead body of beautiful girl"

Mapping from Matrix to Ontology (XIII)

4. Inserting the words per motif

- Example: Motif T16.2 – PrefLabel

```
<http://www.semanticweb.org/tonka/ontologies/2015/5/tmi-atu-
ontology/label#T16.2> a skosxl:Label ;
        skosxl:verbalizedAs
<http://www.semanticweb.org/tonka/ontologies/2015/5/tmi-atu-
ontology/label#T16.2_s_1812> , […]
<http://www.semanticweb.org/tonka/ontologies/2015/5/tmi-atu-
ontology/label#T16.2_s_1970> ;
        skosxl:literalForm "Man falls in love on seeing dead body
of beautiful girl" ;
        dc:creator "Stith Thompson"@en ;
        dc:source "TMI - Motif-Index of Folk-Literature (1955-
1958)"@en ;
        rdfs:comment "The original label for motif T16.2 "@en .
```

Mapping from Matrix to Ontology (XIV)

4. Inserting the words per motif

- Example: Motif T16.2
- an AltLabel

Annotations | Usage

Annotations: T16.2_s_1812

Annotations ⊕

dc:creator
"eTRAP"

rdfs:comment [language: en]
Words of the tale "Sneewittchen Grimm 1812" for the motif T16.2.

dc:source [language: en]
Digital Breadcrumbs of Brothers Grimm

skosxl:verbalizes
◆ T16.2

Property assertions: T16.2_s_1812

Object property assertions ⊕

Data property assertions ⊕

■ skosxl:literalForm "Prinz, Sneewittchen, nicht satt an Schönheit sehen können"@de

T. SEX	
T0-T99. Love	
T16. Man falls in love with woman he sees bathing	null
T16.2. Man falls in love on seeing dead body of beautiful girl	Prinz, Sneewittchen, nicht satt an Schönheit sehen können

Mapping from Matrix to Ontology (XV)

4. Inserting the words per motif

- Example: Motif T16.2 – an AltLabel

```
<http://www.semanticweb.org/tonka/ontologies/2015/5/tmi-atu-
ontology/label#T16.2_s_1812> a owl:NamedIndividual ,
skosxl:Label ;
        skosxl:verbalizes
<http://www.semanticweb.org/tonka/ontologies/2015/5/tmi-atu-
ontology/label#T16.2> ;
        skosxl:literalForm "Prinz, Sneewittchen, nicht satt an
Schönheit sehen können"@de ;
        dc:creator "\"eTRAP\"" ;
        dc:source "Digital Breadcrumbs of Brothers Grimm"@en ;
        rdfs:comment "Words of the tale \"Sneewittchen Grimm
1812\" for the motif T16.2."@en .
```

References

- Dublin Core: http://dublincore.org/

- SKOS: https://www.w3.org/2004/02/skos/

- SKOS-XL: https://www.w3.org/2008/05/skos-xl

- eTRAP project "Digital Breadcrumbs of Brothers Grimm":

  – http://www.etrap.eu/digital-breadcrumbs-of-brothers-grimm/

- Bitbucket repository for the ontology-based TTS application :

  https://bitbucket.org/ceisen/apftml2repo/

Future Work

- Evaluation of the results presented in this talk.

- Generation of multilingual classification systems, with the help of other sources

- Extending the work to other classification systems (for example Propp)