A Set of Annotations for supporting a TTS Application for Folktales

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Abstract

In this short demonstration paper we present different layers of annotation for folktales we have been working on and which are in the process of being integrated in one set of annotations, which is mediated by a formal representation of the annotation elements in an ontological framework. We list in this short text the various modules of this annotation scheme. A main result of this work has been the implementation of a Text-to-Speech (TTS) application for folktales, which is the core of our demonstration system.

1 Introduction

In this short poster and demonstration paper we present work done in the context of different software projects and bachelor or master theses conducted at Saarland University and at DFKI. The goal of those efforts was to develop annotation schemes that support efficient access to topics of interest in folktales for their inclusion in applications. The resulting different layers of annotation for folktales are in the process of being integrated in one set of annotations, which is mediated by a formal representation of the annotation elements in an ontological framework. We list in this short text the various modules of this annotation framework. A main result of this work has been the implementation of a Text-to-Speech (TTS) application for folktales. We also discuss briefly current work on extending the annotation scheme, adding information from two very influential classification schemes used in the international folkloristics.

2 Annotation of Proppian Functions

A first approach to the annotation of folktales was pursued in the context of a cooperation between the first instantiation of the CLARIN-D project[1] and the past

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[1] https://www.clarin-d.de/en/

Dutch NWO Amicus (Automated Motif Discovery in Cultural Heritage and Scientific Communication Texts) project[2]. In this context, we developed an extended annotation scheme for the annotation of folktales with Proppian functions[3]. The work was based on a re-design of the coarse-grained scheme proposed by [11]. The resulting scheme included additionally to the Proppian functions some textual properties, temporal and dialog structures, as well as information on central characters playing a role in the tales. Results of this work are described in [1] and [2]. This scheme was later used for supporting a first information extraction system applied to tales.

3   Ontology-driven automated Textual Analysis of Tales

Building on the work described in section 2, an automated linguistic analysis of tales was developed. The goal was not only to automatically detect characters of the tales, but also to provide for a co-reference analysis such that the actions in which the characters are involved can be fully specified, and thus helping for an automated detection of Proppian functions, together with the involved personages. Results of the analysis are stored in a database, which has been further developed onto an ontological framework: Adding thus not only an annotation layer but also a formal representation level (s. [3]). The ontological representation allows also to apply generalizations for the specification of the characters (human vs animals, or supra natural etc.). The system was also able to operate reference resolution of the kind: daughter can also be a sister etc. Figures 1 and 2 show screen-shots of this ontological framework, as visualized by the Protégé ontology tools[4].

The decision to use an ontological framework turned out to be very useful, since further work on distinct elements of a tales could be easily integrated. So for example the work described in [4] considered the detection of sentiments expressed by the characters of the tales. Such sentiments (joy, happiness, sadness etc.) could be added in a straightforward manner to instances of characters within the time span in which they occur in the tales.

4   Dialogue Structure Annotation for a TTS Output

The detection of dialogue structures in folktales (and in fact in any narrative) is essential in order to know who is "speaking" to whom, as an anchor for building a Text-to-Speech (TTS) system applied to a folktale. This concerns also the detection of the text passages in which a narrator is describing the events. The work summarized in [4] mainly addresses the issue of adding such a TTS functionality to the automatic analysis of the text, as provided by the work described in section 3. The TTS system accesses the instances of the characters in the populated ontology

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[2] https://ilk.uvt.nl/amicus/
[3] These functions were introduced by Vladimir Propp in [10].
[4] See http://protege.stanford.edu/ for more details on those ontology tools.
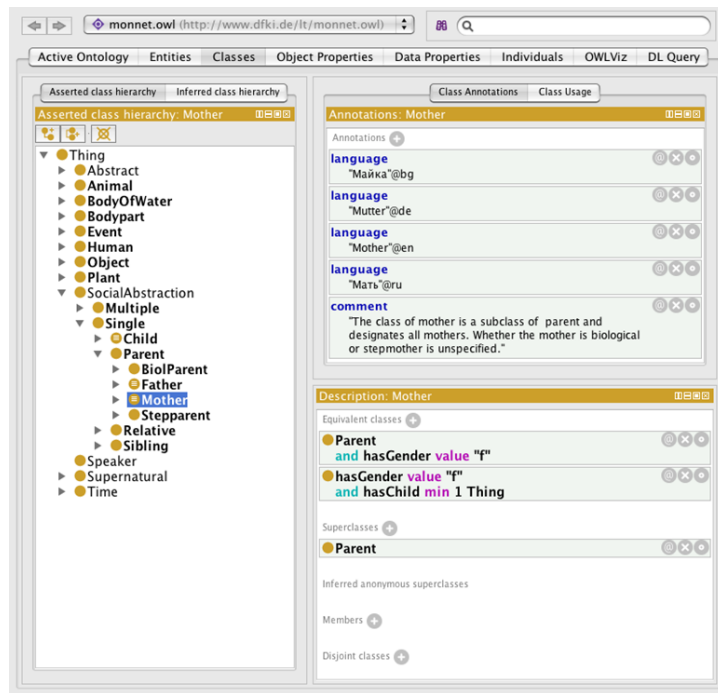
Figure 1: Screen-shot of the definition of the class Mother

(see Figure 2 as an example of a populated ontology), and can retrieve the information on sentiment encoded there and correspondingly model the voice output of the various characters. The TTS system that was used in this case is the Mary system, which is described among others in [12][5]. Figure 3 displays a screen-shot of the system showing the kind of information that is extracted from the annotation for allowing the generation of the TTS output. So for example the information on who is "speaking" (the narrator or one of the character), and which is encoded by the feature "ID". The reader can see the attributes that are associated with the detected character (for example for ID 1 and ID 2. ID -1 is the narrator). It is worth noting that those attributes are stored in the ontology, and some of the attributes are in fact inferred from the text processing. Also the sentiments of the "speakers" are encoded and displayed in this screen-shot within angle brackets.

5 On-going Work

Very recently, we started also looking at other metadata to be used for annotating folktales, and to see how to integrate those with the Proppian functions. We looked for this at the well-known classification systems of Stith Thompson ([6],

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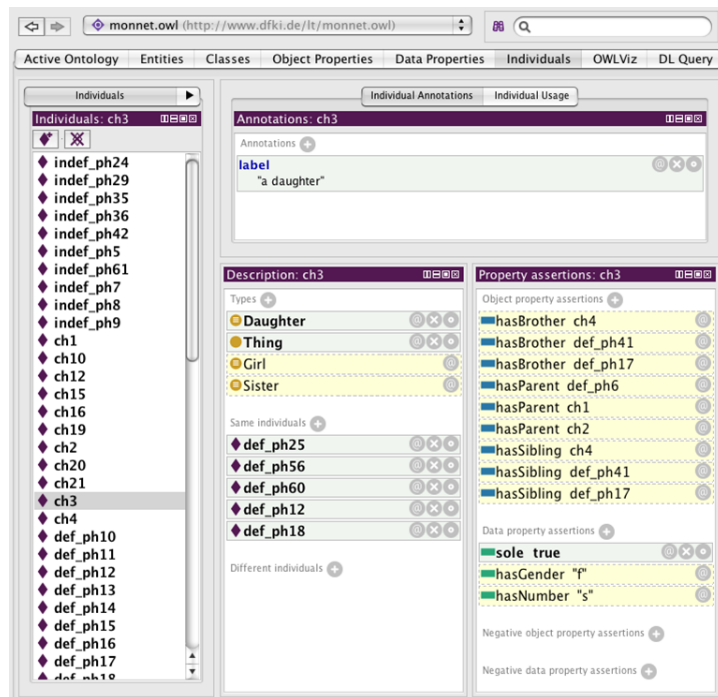[5]More details on *Mary* are given in `http://mary.dfki.de/`

Figure 2: Screen-shot of the ontology after text analysis, listing occurrence of character 3 in text, and after inference mechanisms applied for this character

[5]), which is categorizing motifs used in folktales, Antti Aarne ([7]) and Hans-Jörg Uther ([8]), which are dealing with the types of folktales, and we are starting to integrate those models in our ontology. Additionally we linked the detected characters to WordNet, investigating if this can help for the disambiguation of such characters (see [9]).

6   Conclusion

We presented past and on-going work for providing for annotations for folktales that are supporting specific NLP-based applications. In the course of the different software projects and bachelor or master theses dedicated to this effort we discovered that the use of ontologies is a crucial element for integrating the various elements of the different annotation layers. The successful implementation of a TTS system applied to folktales provided for a proof of concept. We are currently extending our integration work with the ontologization of influential classification schemes in the field of folkloristics.

Figure 3: Information displayed while processing the folktale text prior to its TTS output

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