1 Introduction

In this paper, I present a research program situated at the intersection of narratology and computer sciences, in the main area of Digital Literary Studies. The methodological underpinning of this program is the adoption of formal ontology modeling for the analysis of some relevant concepts in narratology and narrative texts analysis.

Such a computational formalization has various scientific objectives. In the first place, it is an attempt to draw a clear theoretical account of some key concepts of narratology and literary theory. Moretti (2013) in one of its most relevant articles devoted to the methodological foundation of computational text analysis has adapted the epistemological concept of operationalizing proposed by P.W. Bridgman: “Operationalizing means building a bridge from concepts to measurement, and then to the world. In our case: from the concepts of literary theory, through some form of quantification, to literary texts”. This purely quantitative conception is too constrictive in my view. I suggest that computational formal modeling is a suitable kind of operational translation of literary theoretical terms and concepts, though not directly producing quantitatively measurable “proxies” of those terms.

In the second place, a formal ontology is a functional tool, as well. We can use it to add semantic annotations to digital textual corpora. This semantic enrichment, based on dedicated reference ontology vocabularies, allows the execution of complex queries and semantic analysis, using automatic reasoning tools (that is, systems able to infer new knowledge based on the ground knowledge that is asserted and on the semantics of the vocabulary that has been used to model that knowledge). The availability of this kind of applications and frameworks can bring relevant advances in the study of literary phenomena (especially in the field of thematic intertextuality) but also in the didactics of literature.

2 State of the Art

Computational narratology is one of the leading sectors of the post-classical narratology (Herman 1999), the purpose of which is “the study of narrative from the point of view of computation and information processing. It focuses on the algorithmic processes involved in creating and interpreting narratives, modeling narrative structure in terms of formal, computable representations” (Mani 2003). It incorporates and enhances the tradition of formalist and structuralist narratology in a computational perspective mixing it with the concepts and models of knowledge representation.
The field of story grammars (Meister 2003) has traditionally been the central theme of the studies in this field. It should be noted, however, that since the late 80 / 90’s Gigliozzi (2008) and his team have experimented the modeling of narrative structures and characters, with formalisms such as Lisp. Recently, attention has turned toward the use of ontological technologies (Gruber 1993) for the representation of narrative structures both for the purposes of literary and narratological research (Zöllner-Weber 2007) and for the possible applications of storytelling processes in training, communication and production contexts (Damiano and Lieto 2013). Quite recently the preliminary results of an ontological modeling of narratives by Bartalesi, Meghini and Bartalesi, Meghini, and Metilli (2016) have been presented. This formalization tries to capture some basic notions of narratives namely fabula, narration and plot, and can be considered orthogonal to our ontological model of characters.

3 An ontology for narrative analysis

Starting from the methodological framework we have sketched above, I am developing a formal model of narrative based on ontological languages (and relative semantics), in particular in OWL 2 DL (W3C 2009). The rationale of this choice is of course the computational complexity of the inference algorithms licensed by that formalism and the availability of efficient and scalable semantic stores and inferences engines.

The literary theoretical bases of our project are deeply rooted in some of the relevant concepts developed in classical and post-classical narratology. The object of our model, in fact, are two key notions of narrative:

1. character / actor / actant, following the different level of abstraction proposed in the early works of Greimas (1969). Starting from the work carried out since the early 80s by Gigliozzi on the formal structure of the character in the novel and in the short story, I propose a formal model that allows describing the character as a frame (in Minsky’s sense, 1974) composed of nuclear non-negotiable properties and negotiable accessories traits. The character, from this point of view, can be described in terms of a semantic field composed of elements bound together by the force of an isotopic bundle. According to Greimas, two or more elements build an isotopy when they are semantically homogeneous, that is, when they belong to the same semantic level. A cluster that thickens around a root node. In this context we also take into account the recent contributions of cognitive narratology about the concept of “theory of mind” and intentionality in fictional characters (Herman 2003).

2. narrative / fictional world / space, based on the concept of narrative semiotic space of Lotman and of the theories of fiction and narrative as possible worlds (Doležel 1999; Eco 1979; Ryan 1991). There is a deep relation between the notion of character and that of narrative space. According to Lotman (1972), the narrative space to which is bounded defines each character, and the hero is the only character that can move between different narrative spaces. The concept of narrative space can be formalized using the notion of fictional possible world, whose definition is given by Eco (1979, pp. 128-30): “Definiamo come mondo possibile uno stato di cose espresso da un
insieme di proposizioni dove per ogni proposizione $o \circ o \sim p$. Come tale un mondo consiste in un insieme di individui forniti di proprietà”.

4 Conclusions and next steps

The ontological modeling that we are proposing is amenable to various extensions: we can think, in fact, to the problem of modeling the temporal aspect of the narrative world, or to the possibility of binding the abstract ontology of fictional character to an ontology of narrative motifs and themes.

A further step is the exploration of possible convergence with other narrative ontological frameworks, namely the one developed by Bartalesi, Meghini, and Metilli (2016) and Ontomedia (Jewell, Lawrence, and Tuffield 2005), and when possible the mapping with other relevant ontologies and encoding scheme in the cultural heritage domain for interoperability (e.g., Text Encoding Initiative and CIDOC-CRM). This is particularly relevant in that we want to publish our ontology and data sets as Linked Data, through recommended standard publishing methodologies and to appropriately link them to already existing datasets with similar or partially overlapping information in the Cultural Heritage LOD cloud.

The applications of a formal ontology of narrative, finally, are not limited to literary studies. In these years, the attention towards storytelling has grown up also in social sciences, media and game studies, enterprise communication. Our modeling effort can find relevant intersections and applications inside these domains too. We believe in fact that a model of storytelling based on a rich description of fictional characters and worlds can be more effective than those limited to action theory and story grammars formalization.

References


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