StarLion: Auto-configurable Layouts for Exploring Ontologies

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Abstract. The visualization of ontologies is a challenging task especially if they are large. We will demonstrate `StarLion`, a system providing exploratory visualizations which enhance the user understanding. `StarLion` combines many of the existing visualization methods with some novel features for providing better 2D layouts. Specifically, one distinctive feature of `StarLion` is the provision of Star-like graphs of variable radius whose layout is derived by a Force Directed Placement algorithm (*FDPA*) specially adapted for RDF Schemas. This approach enables users to gradually explore and navigate through the entire ontology without overloading them. `StarLion` can also handle multiple namespaces, a very useful feature for assisting the understanding of interdependent ontologies. Another distinctive characteristic of `StarLion` is the provision of a novel method for configuring automatically the *FDPA* parameters based on layout quality metrics, and the provision of an interactive configuration method offered via an intuitive tool-bar.

1 Introduction

The understanding of an ontology with many classes and properties represented as a directed graph (Figure 1(b)), is a hard and time consuming task. Our objective is to alleviate this problem by providing 2D visualizations that could aid users in tasks like: selection of a suitable ontology from a corpus of ontologies, understanding the structure of one particular ontology, and understanding a number of interrelated ontologies.

The field of graph drawing and visualization is very broad. There are many works using *FDP* algorithms and some of them also support star-like views with variable radius. Most of these works refer to general (plain) graphs and they are not RDF-specific. RDF graphs contain more information than plain graphs and have more visualization needs (e.g subclass hierarchies must be vertical). For this reason we did not rely on such algorithms but we designed a dedicated force directed algorithm which combines the *spring-model*([2,4,3]) with the *magnetic-spring model*([6,5]). Apart from this, the notion of namespaces does not exist in plain graphs, while in RDF graphs plays an important role. Finally, and since different graphs exhibit different graph features the layout algorithm must be

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