

Antipattern Comprehension An Empirical Evaluation

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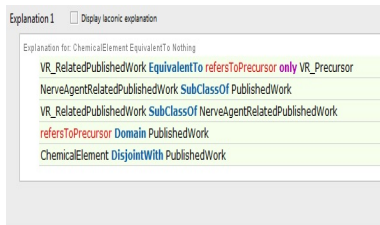
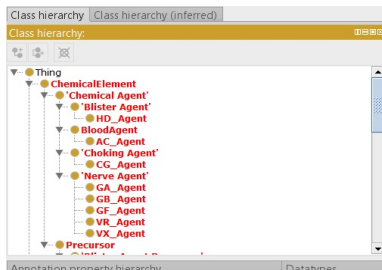
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Visual Justifications for Ontologies (EP/M016323/1)

Motivation I

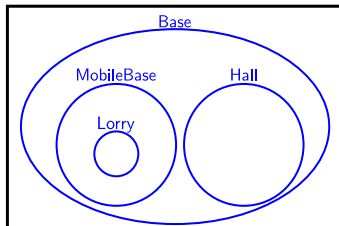
- Comprehension of justifications is known to be difficult for even experienced ontology engineers
- Even with assistance of reasoners, understanding incoherence is still difficult



- Our approach to alleviating the burden on engineers is through visualization

Motivation II

- Visualizations can provide free-rides whereby information can be read-off a diagram that would otherwise have to be inferred



- Most visualization tools show only the hierarchical structure of an ontology, and do not visualize object or data properties
- Incoherence in an ontology can, however, arise from the interaction between concepts and properties

Motivation III

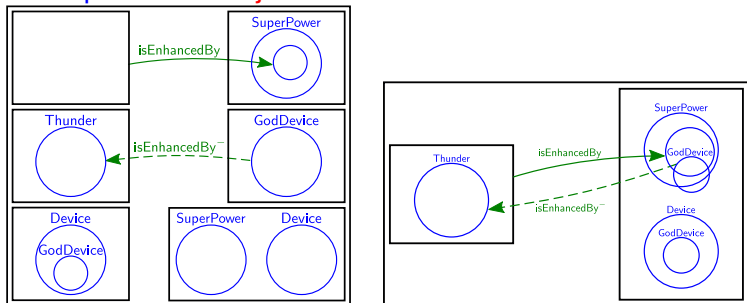
- Concept diagrams, the visualization used here, visualize both concepts and object properties

isEnhancedBy Range SuperPower

Thunder SubClassOf isEnhancedBy some GodDevice

GodDevice SubClassOf Device

SuperPower DisjointWith Device



G. Stapleton et al. Towards Diagrammatic Ontology Patterns (2013)
J. Howse et al. Visualizing Ontologies: A Case Study (2011)

Method

Research Question

Does visualization of incoherent ontologies make them easier to understand?

- A set of antipattern categorizations extracted from online TONES ontology repository
- Focus only on identification of logical contradictions
- Adopt a scenario of superheroes and their villains for the antipatterns
- Methods of visualizing antipatterns
 - ▶ interpreting every axiom to produce multi-diagrams
 - ▶ merging multi-diagrams to produce a single diagram
- Perform an empirical evaluation of both methods along with a textual representation of the justification using Protégé

Results & Future Work

- An affirmative answer to our research question
 - ▶ participants using merged diagrams never performed worse than those using either of the other two treatments
 - ▶ participants using Protégé statements never performed better than those using diagrams
- When does information become so complex that visualization is no longer beneficial?
- Create a tool that could produce visual justifications using merged diagrams
- Is debugging ontologies easier and more reliable when using visualization?
- More details could be found in our poster