Symbolic Explainable AI

DSAI Master at UFAZ

Project Topic

The general objective of the project is to develop an intelligent system with an ontology in OWL (OWL 2), to specify SWRL rules on this ontology, to check its consistency with a reasoner and, optionally, to query this ontology using SPARQL rules.

Modelling may focus on a sport of your choice by targeting a specific description of that sport (rules, championships, etc.).

The objective of the project is to use all the OWL language operators to show the expressivity of the language and the tools discussed and not to make a huge model in size.

The report must be qualitative and not quantitative. It is a question of taking all the elements seen in progress through a personal example.

The report should be divided into 4 parts (in one document)

1) Modeling

- General description of the selected topic
- Information modelling: you can give a diagram of UML classes and the description of complementary axioms in the form of formulas of description logic. Description of the SWRL rules

2) Implementation in Protégé and eventually sample SPARQL queries

- Description of the implementation in OWL on some significant elements of the schema (the complete code will only be given as an .owl file)
- Some examples of SPARQL queries on the implemented program with their results (SPARQL has not been discussed during our course, this is an optional work that can give you supplementary marks)
- Some examples of the results of the execution of the SWRL rules

3) Use of a reasoner

- Description of the ontology consistency check (with different examples of inconsistencies).
- Description of examples of inferences made by the reasoner on the schema (subsumption, equivalence or disjunction of concepts).
- Description of examples of inferences made by the reasoner about individuals (such as the population of a concept that has been defined by equivalence, or the inferred type (s) of an individual who has certain properties)

- Explanation of the reasoning by hypothesis of open world that is applied in description logic with illustrations of the proposed application on your model
- Explanation of the hypothesis of uniqueness of names (or non-unicity) and illustration on your modelling.

4) Evaluation and Conclusion

You will need to submit on Moodle the report, code and any appendices you consider necessary