Master 2 internship proposal

Strawberries and inconsistent ontologies: preferences to the rescue

This M2 internship is about how to handle inconsistent ontological knowledge bases and argumentation. In the framework of the INRA GloFood Pack4Fresh project, the practical goal is to support decision making for strawberry packaging in order to reduce waste (people throwing strawberries at the bin because they went off due to unsuited packaging). Overall, we want to link consumer behavior insights with socio-economic developments and technical properties of packaging etc.

To model the data, we use ontological knowledge bases. Due to the fact that information comes from different sources, such a knowledge base can be inconsistent. When dealing with an inconsistent ontological knowledge base, the standard approach is to use its maximal consistent subsets, called repairs. The main idea of this work is to define an argumentation-based user interface by constructing arguments and attacks between them in order to allow the user to better understand why certain options can or cannot be accepted together (see Tamani et al. 2015).

Also, we can explain to a user why an option is preferred to another option if such preferences exist between different sources. The main technical novelty of this work is to introduce preferences for such interface (see Croitoru et al. 2015). Namely, in real life, one piece of information can be more certain than another. Also, some goals are more important than others. This is why we need to investigate how an arbitrary preference relation can be used to rank the possible outcomes of the system (i.e. different strawberry packaging choices).

The candidate should have solid knowledge about ontological knowledge bases and have very good implementation skills.

Location: Montpellier, UMR LIRMM et IATE

Contacts:

Madalina Croitoru (Madalina.Croitoru@lirmm.fr) and Patrice Buche (Patrice.Buche@supagro.inra.fr)

Bibliography:

Tamani N., Mosse P., Croitoru M., Patrice Buche, Valérie Guillard, Carole Guillaume, Nathalie Gontard. An Argumentation System for Eco-Efficient Packaging Material Selection. Computers and Electronics in Agriculture 113:174-192. (Paper available here)

Madalina Croitoru, Rallou Thomopoulos, Srdjan Vesic. Introducing Preference-Based Argumentation to Inconsistent Ontological Knowledge Bases. PRIMA 2015: 594-602