FuL

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Background

The body of knowledge in biology, particularly in virology and immunology, is incremental in volume and complexity. This is why for the production of that knowledge it would be useful to have it represented in a formal language inside a knowledge base. Subsequently, different methodologies for analysis and manipulation could be developed, allowing validity checks to be performed on conclusions obtained in experiments.

FuDePAN's Logic processor (FuL) (http://ful.googlecode.com) is being developed to organize, interpret, verify and explore the knowledge in molecular biology, applied to virology and immunology in particular. This will help find incongruence and automatically derive conclusions from that knowledge, being it's main function the verification of conclusions obtained by results from experiments using queries.

The test case will be the following conclusion obtained from experiments done by FuDePAN:

- *Validate the conclusions obtained in the Junin experiment about the temperature-change effects over the virus secondary structure:*
  Corroborate that the line of thought that includes the predictions of the effects of febrile state over the Junin RNA secondary structure, in which it's hypothesized that the temperature increment reduces the production of nucleoproteins because the hairpin loop in the intergenic region presents dissimilar characteristics when it's compared the two ambisense genome strings when the temperature is increased.

This tool has a plug-in architecture, simplifying the adaptation of it to new types of knowledge. For that, an API will be provided, which defines the way in which knowledge flows between the plug-ins and Ful's core, and also a SDK composed of libraries and tools required for building plug-ins.

The kernel of the tool will be composed of a planner based on PDDL (Planning Domain Definition Language) semantic and a manager that will be the interface between the plug-ins registered in that session and the planner. Via a XML file, it can be possible to register the plug-ins that FuL will utilize in that session and configure the session variables, both from FuL and the plug-ins.

Also we will provide a knowledge representation language for virology area base on DL(Description Logic), which will be used for representing knowledge in the KB(Knowledge Base) to load in that session and make queries to FuL. In particular, FuL will include a Semantic Reasoner based on DL as a plug-in.

References

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