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Dottorando del XXIII ciclo

Abstract of the Thesis:

Heterogeneous Knowledge Representation Formalisms in the Semantic Web

The Semantic Web, according to Tim Berners Lee's vision, is an evolution of the Web consisting of a set of tools which will make it possible for the machines to handle automatically the huge quantity of information already there in the network, and therefore to give user new ways of improving ways of retrieving data over the Internet.

This thesis has been focused mainly on Knowledge Representation. Knowledge we can get from the web data needs to be represented in a formal, unambiguous way, in order to be processed efficiently by machines. To that end, several different knowledge representation formalism were created, which have significant differences in both syntax and semantics.

The goal of this thesis was to propose some methodologies for integrating some formalisms substantially different from each other, in particular the ones connected to description logics and the ones which are derived from logic programming. A general technique for dealing with such integration has been proposed: translation of logic formalisms, in a modular way. Several formalisms have been translated, like DL fragments (ELHI and OWL2 profiles), or other logic formalisms (Frame Logic).

Finally, a part of this thesis has been focused on the realization of a OWL2 RL reasoner relying on RIF and a logical language called DLV-HEX, based on Logic Programming. This last part was done in Ireland, by the Digital Enterprise Research Institute of Galway.