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Workshop IV

ONTOLOGIES AND LEXICAL SEMANTICS

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- LIPN, Université Paris 13
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"Casa San Bernardo", via Laurentina 289

Abstracts

Monica Monachini, ILC, CNR, Pisa

Towards interfacing lexical and ontological resources

The use of ontological resources is fundamental to computational linguistics; the recent decade saw an increase in the production of lexical-semantical resources that have some form of interface with one or more ontologies.

There is still a long way to go to understand the relation and interplay between lexical and ontological resources; an ample debate is currently taking place on how they can be interfaced/merged at the level of applications and (also involving the ISO community) how to develop best practices for linking them.

In this talk we shall present some particularly interesting research lines and case studies conducted in some of the projects ILC has contributed to (Simple OWL, Biolexicon, Kyoto, ImagAct) as well as some well known resources by others (Lexinfo, MONNET/Lemon); we shall give an overview of their goals and characteristics, as well as of the type of mapping that has been produced and the advantages these mappings provide in applications.

Aldo Gangemi, ISTC, CNR, Roma

Some design patterns for the ontology-lexicon interface over the Web

I will present some problems (and possible solutions) emerging when ontologies and natural language representation or processing are combined, with particular reference to the case of Semantic Web and Linked Data, consisting of heavily distributed, decentralized, incomplete knowledge that is contained in entrenched data structures that span from maximally informal to highly formalized representations.

Some design practices ("patterns") will be presented showing the need for hybridizing such types of knowledge, and what semantics is needed to deal with the hybridization. For example:
a) how to reconcile (mainly intensional) lexical semantics with (mainly extensional) formal semantics;
b) how to contextualize ontologies in a cognitively sound way;
c) how to live with multiple logical layers in complex domains such as legal and biomedical ones.
I will propose a (formal) semiotic framework, and will play with the multifarious aspects, by which a lexicon affects the extraction and usage of formal knowledge. Some applications that adopt this framework will be exemplified.

Claudia Casadio, Università di Chieti - Pescara

Ontologies in linguistics and psychology: theoretical models and open problems

Ontologies play a crucial role both in linguistics and psychology. In the talk we consider a number of relevant issues in the field and the theoretical models involved. Concerning linguistics, starting from the Frege/De Saussure dualistic analysis of sign and meaning, the following questions are addressed: parts and wholes relations and interpretation of different kinds of collective entities by means of plural vs. singular noun phrases, indefinite and generic expressions.
In this context the relations between ontologies and mereologies are briefly considered. On the side of psychology, we will pay particular attention to the dimension of human reasoning and the relevance of ontologies in the study of categorization and the definition of concepts and prototypes. In conclusion, an experimental study on reasoning with quantifiers, by expressing the positive vs. negative duality, will be presented (the research is developed in cooperation with the Neuroscience Department of the University of Chieti).

Daniele Porello, University of Amsterdam

Ontology Merging as Social Choice

The problem of merging several ontologies has important applications in the Semantic Web, medical ontology engineering, and other domains where information from several distinct sources needs to be integrated in a coherent manner.
We propose to treat ontology merging as a problem of social choice, i.e., as a problem of aggregating the information coming from a set of individuals into a collective attitude, by means of a procedure that is capable of balancing normative and efficiency desiderata.
We do this for the case of ontologies that are modelled using description logics. Specifically, we formulate and discuss a number of desirable properties for ontology merging procedures, we identify the incompatibility of some of these properties, and we define and analyse several concrete procedures.

Remo Pareschi, Dipartimento STAT, Università del Molise

An inside-out perspective on lightweight ontologies

Conceptual trees, also known as lightweight ontologies (and in other contexts as folksonomies), have traditionally been exploited for the purpose of classifying, of analyzing and, generally, of making order within large amounts of unstructured information. The process underlying this approach can be described as follows: first, collect the information which is deemed relevant for a given community of users; in parallel, define a conceptual structure (the ontology) where the different concepts applicable to subparts of the collected information are related and maintained; finally, classify the information by partitioning it and by associating the parts with corresponding concepts, and by reflecting the relationships between the concepts into the analysis of the information. This use of ontologies is effective for the creation of large information archives, but is subject to heavy maintenance work, in that both information and concepts are apt to change, and thus ontologies have to be re-aligned and information needs to be classified and analyzed again. We propose here a different perspective that appears as more dynamic and may extend the adoption of ontologies beyond the existing context of use. Rather than bringing information to the ontologies in order to classify it, we view ontologies as approximations of the information which a user may be seeking through the exploration of such domains as the Web, a social network like Facebook, a corporate intranet etc. The concepts in the ontology are thus used as attractors of related information, in a way not dissimilar from what ordinary search engines do through the use of keywords, with the crucial difference that, in place of a flat list of ranked results, what is returned

here is a navigation schema derived from the structure of the ontology itself. In this way ontologies can be used to effectively identify and map out regions of interest in very large information domains.