

Using Foundational Ontologies for Conceptual Domain Analysis and Terminology Merging

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I present a description of the conceptual tools used in several projects involving domain ontology building, including applications in the biomedical domain.

A review is given of the principles used in the definition of the DOLCE *foundational* ontology. A foundational ontology contains an axiomatic characterization of the basic domain-independent concepts and relations that can be used to design a high-quality domain ontology.

The ONIONS methodology for the transformation of terminologies into ontologies is also briefly described wrt a large-scale application to the UMLS repository. ONIONS uses foundational ontologies and linguistic principles (e.g. dependency structure and systematic polysemy) to build a "core", strongly axiomatized ontology of a domain.

Some examples are provided, which introduce relevant ontological issues for the biomedical domain, such as individuals vs. concepts, taxonomy vs. paronymy, unity vs. mass, function vs. structure, plan vs. procedure, heterogeneous attributions, etc.

Biographical notes:

Aldo Gangemi is research scientist at the Institute of Cognitive Sciences and Technology of the Italian National Research Council (CNR) in Rome, since 1995. Since 1989 he works at the CNR in ontology-related research (including medical informatics projects).

His research currently focuses on ontology engineering (conceptual analysis, ontology merging) in several domains (law, medicine, fishery, computer science, etc.) for different tasks (information extraction and retrieval, catalogue maintenance, quality assessment, planning, etc.).

He is currently responsible or involved in various international academic and industrial projects that share the use of ontologies as a key technology to enhance information processing.