Computing an Ontological Semantics for a Natural Language Fragment

The key objective of the research that has been carried out has been to establish theoretically sound connections between the following two areas: • Computational processing of texts in natural language by means of logical methods • Theories and methods for engineering of formal ontologies We have tried to establish a domain independent “ontological semantics” for relevant fragments of natural language. The purpose of this research is to develop methods and systems for taking advantage of formal ontologies for the purpose of extracting the meaning contents of texts. This functionality is desirable e.g. for future content–based search systems in contrast to today's keyword based search systems (viz., Google) which rely chiefly on recognition of stated keywords in the targeted text. Logical methods were introduced into semantic theories for natural language already during the 60’s in what is today known as Montague semantics. However, this well–established tradition addresses mainly the domain independent logical structures of language such as quantifiers/determiners by means of logic [18], such as type theory [2]. By contrast this project focuses on the domain–specific parts of language (nouns, verbs, adjectives) introducing formal so–called generative ontologies as semantic target domains for noun– and verb phrases. Such a logico–semantic theory links the meaning of a sentence phrases to nodes in the chosen ontology for the domain.

Publication information
Place of publication: Kgs. Lyngby, Denmark
Publisher: Technical University of Denmark (DTU)
Original language: English

Series: IMM-PHD-2010
Number: 242
Main Research Area: Technical/natural sciences
Electronic versions:
phd242_bas.pdf
Source: orbit
Source-ID: 267632
Publication: Research › Ph.D. thesis – Annual report year: 2010

ONTOGRABBING: Extracting Information from Texts Using Generative Ontologies

We describe principles for extracting information from texts using a so-called generative ontology in combination with syntactic analysis. Generative ontologies are introduced as semantic domains for natural language phrases. Generative ontologies extend ordinary finite ontologies with rules for producing recursively shaped terms representing the ontological content (ontological semantics) of NL noun phrases and other phrases. We focus here on achieving a robust, often only partial, ontology-driven parsing of and ascription of semantics to a sentence in the text corpus. The aim of the ontological analysis is primarily to identify paraphrases, thereby achieving a search functionality beyond mere keyword search with synsets. We further envisage use of the generative ontology as a phrase-based rather than word-based browser into text corpora.
Ontological semantics in modified categorial grammar

Categorial Grammar is a well-established tool for describing natural language semantics. In the current paper, we discuss some of its drawbacks and how it could be extended to overcome them. We use the extended version for deriving ontological semantics from text. A proof-of-concept implementation is also presented.

Formal Ontologies + Natural language semantics = Ontological semantics

Department of Informatics and Mathematical Modeling
Period: 01/10/2007 → 22/06/2011
Number of participants: 6
PhD Student: Szymczak, Bartlomiej Antoni (Intern)
Supervisor:
Jensen, Per Anker (Ekstern)
Main Supervisor:
Nilsson, Jørgen Fischer (Intern)
Examiner:
Villadsen, Jørgen (Intern)
Dybkjær, Hans (Ekstern)
Lenci, Alessandro (Ekstern)

Financing sources
Source: Internal funding (public)
Name of research programme: DTU, Samfinansiering
Project: PhD