A Computational Approach to Semantic Ontologies

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Abstract

How do we assign meaning to words? This project investigates semantics from a lexical perspective, using the WordNet and OpenCyc ontologies to create a semiotic map of our consensus reality. Given a list of words, how can we find the word least like the others? Through a heuristicial search across the corpora of lexical relations, computational semantics can discover the contextual meaning of words, even when the only context given is the other words from which it must differentiate itself. This method, which has not been given a name previously, will hitherto be known as dynamic word sense disambiguation.

Background and Introduction

What are ontological semantics? Semantics is the study of the meaning of words, and an ontology is a network showing the relationships between words. The relationships most relevant in this scenario are lexical relations: synonyms, antonyms, hypernyms, hyponyms, meronyms, and holonyms (figure 1).
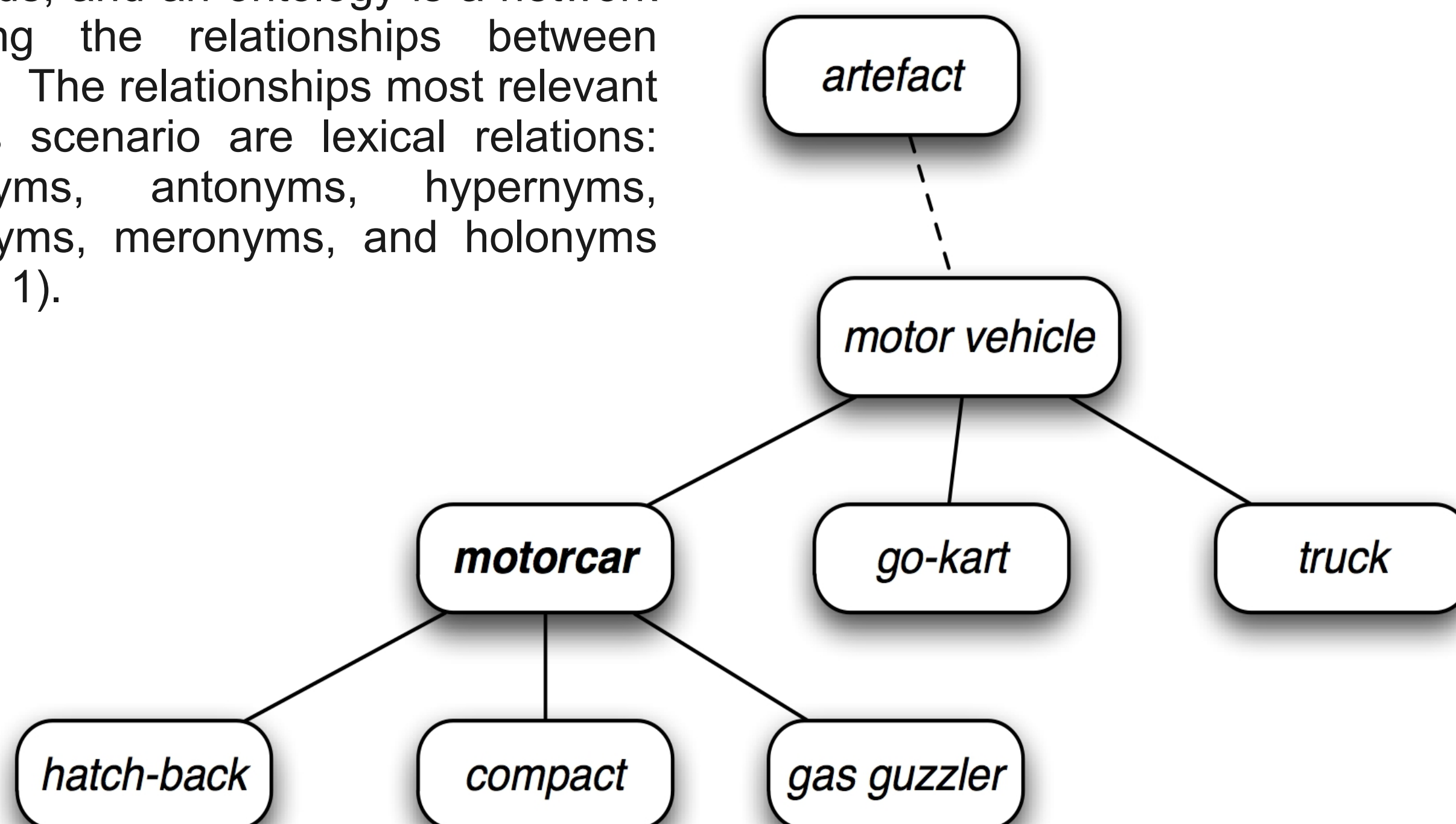
Discussion

To approach the issue, this author used an algorithmic search from both words to find the "depth' at which they connect, either hyponymically or hyponymically. Meronyms and holonyms can be used in the same fashion. For verbs, which don't have clear lexical relations as defined thus far, a special relation called entailment was used instead. Eating entails chewing, for example.

Results and Conclusions

The Wordnet corpora is incomplete and inaccurate at parts. To augment, this author will continue developing a statistical corpora method to build lexical relations from online corpora such as political blogs and mainstream media outlets.

Fig 1: Holonyms and hypernyms
Source: http://nltk.googlecode.com