

## Building the Global WordNet Grid

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Lexical databases are built for an ever-increasing number of languages (Singh 2002, Sojka et al 2004, 2006, Vossen 1998), inspired by the development of the Princeton WordNet (Fellbaum 1998). The Global WordNet Association aims to encourage this growth and to maximize sharing and interoperability of tools and methods; another major goal is to ensure the interlinking of the databases' lexical contents. But efforts towards interconnection and reusability have progressed unevenly and opportunistically within the community of wordnet developers. Attempts to link lexical elements have primarily relied on Princeton's English WordNet as a "hub". This presents obvious problems, as English does not lexicalize the same concepts as other languages; as a result, wordnets following this approach might well be biased towards the structure and lexical coverage of English. Another, language-independent approach is needed. At the 3rd Global WordNet Association conference, a proposal was made for building a comprehensive worldwide wordnet Grid.

A semantic network like WordNet shows structural gaps, where the geometry of the arcs expressing semantic relations would require a word, yet where the language does not have one. For example, Fellbaum (1998) argues for the existence of specific "accidental" gaps in the English verb lexicon on the basis of syntactic evidence. Cross-linguistic differences in lexicalization patterns abound. Arguably, the concept-word mappings of any given language are to some extent accidental; existing words do not fully reflect the inventory of concepts available to speakers. That inventory can be represented in the non-lexical ontology of the Suggested Upper Merged Ontology (SUMO) (Niles and Pease 2001), which is an open-source, formal ontology stated in first-order logic. SUMO consists of an upper level of roughly 1000 terms and 4000 axioms, a mid-level ontology that has several thousand more terms and definitions, and domain ontologies that cover over several dozen specific areas including

world government, finance and economics, altogether totaling 20,000 terms and 70,000 axioms. SUMO has been mapped by hand to all of the WordNet 3.0 noun and verb synsets (Niles and Pease 2003).

The construction of the Grid will initially focus on three different sets of concepts:

1. The [Common Base Concepts](#) (Vossen 1998): a set of concepts that play a major role in the building of wordnets in various languages, e.g. the concepts of *person* and *vehicle*.
2. The Basic Level Concepts (Rosch 1977): a set of concepts that are frequent and salient; they are neither overly general nor too specific, e.g. *house*, *apple*, *car*. “Sister” Basic Level Concepts elaborate their shared superordinate concept in a way that maximally distinguishes the Basic Level Concepts from one another, whereas concepts subordinate to the Basic Level Concepts do not add highly distinguishing features.
3. Other concepts lexicalized in languages that relate to the first two sets, e.g. verbs like *sell* and *buy* that represent different perspectives of the same process.

The Common Base Concepts (CBCs) typically are found at the top of a wordnet hierarchy and subsume many hyponyms. The semantic implication of the wordnet structure is preserved, but the ways in which wordnets are structured across languages vary. SUMO provides a common semantic representation for different wordnets. For example, although *container* is a CBC, it is not lexicalized in Dutch and therefore the Dutch wordnet will have a mapping of more specific *containers* to this CBC. BLCs are expected to be universally lexicalized and well represented in SUMO, where the mappings from wordnets is relatively straightforward, i.e., the appropriate lexemes are labels for equivalent concepts in SUMO (following Fellbaum and Vossen 2007). Other areas of the lexicon are likely exhibit language-specific idiosyncracies. Some words may refer to notions that are unique to a given culture; these need to be represented in the ontology. Others idiosyncracies are linguistic in nature, such as the lexicalization of gender, aspect, perspective, etc. From an ontological point of view, such lexicalizations do not warrant extensions to the interlingua, but the Grid must provide a formal semantic grounding as well as the possibility to relate these lexicalizations cross-linguistically through

complex mappings to the set of concepts. For example, *teacher* in English is underspecified for gender, while other languages encode a gender distinction lexically.

The procedure for constructing the Grid will initially focus on the CBCs and the BLCs, which will be expressed in terms of SUMO definitions. We invite people from all language communities to upload synsets from their language to the Grid, so that it will gradually come to be representative for many languages. The Grid will be freely and publicly available.

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