POETICON: GROUNDING RESOURCES AND MECHANISMS FOR ARTIFICIAL AGENTS

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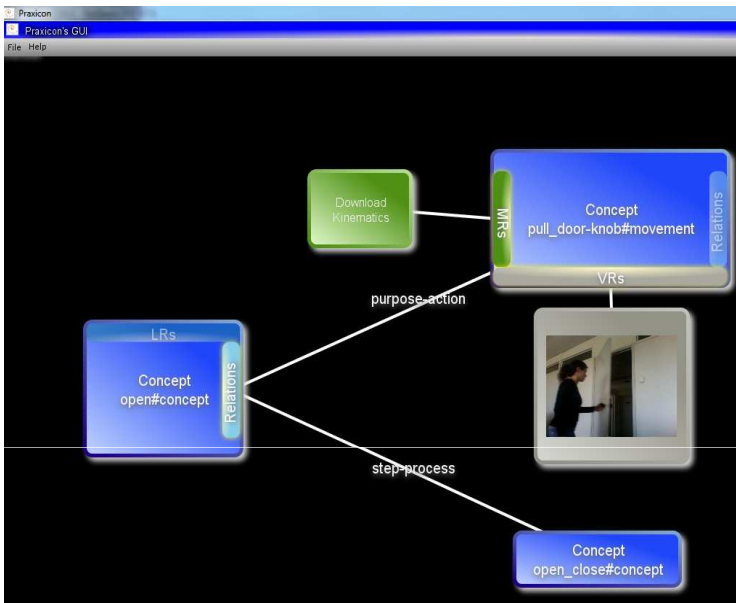
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poeticon
The Poetics of Everyday Life

PRAXICON: a grounded, compositional & generative concept world

One of the main objectives of the POETICON FP7-STREP project is the development of a resource that will allow artificial agents to understand intentional human behaviour and generate appropriate responses, in everyday life interaction scenarios. Thus, we developed the PRAXICON, a *Grounded Conceptual Knowledge base tightly coupled with programs that perform a generative analysis of sensorimotor representations and conceptual structures*.

The PRAXICON Manifesto

The PRAXICON views concepts as
(a) multi-representational units of meaning, i.e. units that one knows/learns/acquires through different symbolic and sensorimotor experiences (e.g. natural language, visual and motoric representations);
(b) units of meaning that are also defined through their rich semantic network with other concepts. It advocates both the universal nature of sensorimotor representations and the expressive and dynamic nature of language representations, by incorporating concepts that inherently have one or another type of representation only.

The PRAXICON embodies an alternative suggestion to the symbol grounding theory, an extension and modification of the traditional grounding premises, the Double-Grounding:
(a) Symbols are not simply grounded to sensorimotor representations, they contribute to the grounding process by lexicalizing and/or morphosyntactically expressing a number of cognitive processes on concepts and spatio-temporal modifications of their status, and
(b) Not all concepts are directly grounded, some concepts are grounded indirectly through their network of semantic relations to other concepts.

Furthermore, the PRAXICON advocates the compositional nature of sensorimotor representations and provides generative mechanisms for their analysis; this perspective has led to a different view of compositionality in language and the related generative mechanisms.

Automatic Population of the PRAXICON:

The very first release of the PRAXICON has been populated automatically by drawing from:
(a) The COSMOROE annotated corpus of audiovisual documents and newspaper caricatures (10 hours of TV travel series, 50 newspaper caricatures);
(b) The POETICON Cognitive Experiments ("Think aloud" method for eliciting verbal references to objects and actions in a "lithic tool description" setup); and
(c) The WordNet (Automatic processing of the resource to turn it from a sense-based into a reference-based lexical database)

The next release will incorporate information from the POETICON enacted everyday activities corpus, a multisensory corpus that is being processed by the POETICON partners for language, visual and motoric representation analysis.

The development of the PRAXICON relies on innovative scientific findings and technological achievements that come out of the tasks performed by all POETICON partners:

● PRAXICON design, database development, visualisation, language representation analysis, automatic extraction of information from structured, semi-structured & legacy data (Institute for Language and Speech Processing, Greece)

● PRAXICON visual and motoric action representation analysis (University of Maryland, USA)

● PRAXICON visual object representation analysis (University of Ljubljana, Slovenia)

● POETICON multisensory corpus of populating the PRAXICON and facial expression representation analysis (Max Planck Institute, Germany)

● Neurophysiological grounding of the PRAXICON (University of Ferrara, Italy)

● Proof of concept demonstration of using the PRAXICON by the iCub (Italian Institute of Technology, Italy)