

POETICON

The Poetics of Everyday Life: Grounding Resources and Mechanisms for Artificial Agents

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Everyday human interaction with the world and with others involves a constant series of perception, understanding and generation transactions. *It is a process of using sensorimotor means for enacting situations that have been experienced before or for reacting to new ones, an intentional process that is in many cases accompanied by natural language to indicate intentionality clearly.* The acts involved are everyday acts, the natural language used is simple colloquial language; in other words, it is the other end of what Aristotle called “poetics” in art: the intentional enaction of *important* aspects of life with the use of *fine* natural language.

POETICON explores the “poetics of everyday life”, i.e. the synthesis of sensorimotor representations and natural language in everyday human interaction. This is an old problem, one that relates to the long Artificial Intelligence (AI) quest for meaning, in both understanding others and communicating one’s own intentions. While extracting meaning from and generating meaning with sensorimotor or symbolic representations (i.e. moving or static images, action, text/speech) has been the objective in most AI sub-disciplines (e.g. Natural Language Processing, Image Understanding etc.) the research focus has mostly been on *individual types of representations* (e.g. visual, motoric or linguistic) rather than on their *integration*. There are a number of interrelated reasons that have hindered research to focus on such integration: *difficulties in measuring sensorimotor human behaviour*, and *analyzing visual and motoric representations*, *the tendency for isolation among researchers* working on e.g. extracting meaning from language or images, *lack of a corresponding theoretical, cognitive or/and neurophysiological background* that would provide a solid basis for computational investigation of the issue.

POETICON suggests *a new solution* to this AI quest for meaning that will be based on measurements of human behaviour. Guided by cognitive and neurophysiological experiments and using a humanoid as an implementation tool, POETICON will capture/measure and computationally structure human behaviour (human body movements, facial expressions, manipulation of objects) with a two-fold objective:

- **The creation of the PRAXICON, a computational resource which associates symbolic representations (words/concepts) with corresponding sensorimotor representations, as well as patterns of combinations among these representations for forming conceptual structures at different levels of abstraction.** The resource will be the output of *computational tools that will be developed for the analysis of sensorimotor representations*, of *cognitive methods that will be used for establishing the associations* with natural language, and of a *learning mechanism* that will be developed for extending the resource automatically.

The PRAXICON will be a unique computational resource for use in a number of computational applications for allowing artificial agents/systems *to tie* concepts/words of different levels of abstraction to their sensorimotor instantiations (catering thus for disambiguation) and to untie sensorimotor representations from their physical specificities correlating them to conceptual structures of different levels of abstraction (catering thus for intentionality indication). In other words, going bottom-up in the resource (from sensorimotor representations to concepts) one will get a hierarchical composition of human behaviour, while going top-down (from concepts to sensorimotor representations) one will get intentionally-laden interpretations of those structures.

- **The exploration of the association of symbolic and sensorimotor representations through cognitive and neurophysiological experiments and experimentation with a humanoid as driving forces and implementation tools for the development of the PRAXICON, respectively.**