What's in a name?

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In recent years the interest in logical models applied to practical problems such as planning and robotics has been increasing. In this paper we define a logic-based generic model for a cognitive agent [Bit97]. We define a *cognitive agent* as an entity associated with a set of non contradictory propositional theories, that represent its knowledge about a given world. The *states of the world*, relevant to a given theory, are defined as the possible truth assignments to a set of *primitive* propositional symbols that occur in this theory. We suppose that the world drifts along the possible states (i.e., assignments), but changing only one primitive propositional symbol assignment at each moment. The primitive propositional symbols can be *controllable* or *uncontrollable*. Roughly, uncontrollable symbols correspond to *perceptions*, controllable ones to *actions*. Each theory can itself be interpreted as an *abstract* propositional symbol, that may occur in other theories. The idea is that each theory represents some *concept* in the world. From the agent point of view, these concepts are characterized by some patterns of truth assignments, represented by its propositional theories. The relevant patterns must be learned. The theories are represented by the conjunctive and disjunctive normal forms, enriched to contain annotations that explicitly store their relation [BT01]. Manipulation procedures implement learning and prediction cognitive capabilities. The main contribution is the suggestion that the semantics of a logical theory may not be a mapping from syntactic expressions to an outside world reality, but the holographic relation between two syntactic representation to which the agent knowledge is limited. In our model, the agent does not know the world, it only knows its internal theories whose primitive propositional symbols have a perceptual relation with something outside (qualia) that is in principle knowable. On the other hand, it is capable of reifying its internal theories in the form of abstract propositional symbols that can be used to construct more complex theories.

Références

[Bit97] G. Bittencourt. In the quest of the missing link. In *Proceedings of IJCAI 15, Nagoya, Japan, August 23-29*, pages 310–315. Morgan Kaufmann (ISBN 1-55860-480-4), 1997.

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