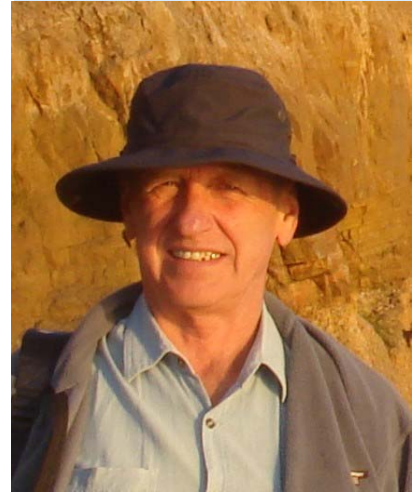


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## The Logical Way to Be Artificially Intelligent

### Abstract:

Abductive logic programming (ALP) can be used to model reactive, proactive and pre-active thinking in intelligent agents. Reactive thinking in ALP uses a logical form of condition-action rules, in which goals may be implicit, to generate candidate actions in response to changes in the environment.

Proactive thinking, on the other hand, uses beliefs, to reduce explicitly represented goals to sub-goals and ultimately to candidate actions. In both cases, pre-active thinking generates possible consequences of candidate actions, to help in deciding between the alternatives. Deciding between alternative actions and courses of action can be performed in different ways, for example by using decision theory or simply by using heuristics.

The different kinds of thinking can be performed as they are needed, or they can be performed in advance, by compiling high-level, proactive thinking into lower-level, reactive form. On the other hand, sometimes lower-level condition-action rules can be decompiled into higher-level explicit representations of goals and beliefs. This use of logic at multiple levels is analogous to the dual-process model of human thinking, in which conscious and sub-conscious thinking can operate in tandem.

ALP used in this way can, not only provide a framework for constructing artificial agents, but also serve as a cognitive model of human agents. As a cognitive model, it potentially combines both a descriptive model of how humans actually think with a normative model of how humans can think more effectively.

**Time:** Thursday, 4.12.2008, 15:00-16:15 (punctual)

**Location:** EI 5, Gußhausstraße 25, 2. Stock, 1040 Wien

Prof. Dr. Dietmar Dietrich

Prof. Dr. Thomas Eiter



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