ELECTRONIC NEWSLETTER ON REASONING ABOUT ACTIONS AND CHANGE

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Today

Should actions be first-class citizens in logics of actions and change, so that it is possible to have action variables, to quantify over them, to minimize models with respect to the set of actions in them, etc? We have already touched on this topic before, namely in the discussion about the Kakas/Miller article (question number 2, initiated by Tom Costello and with a number of follow-up comments). Now the same question comes up again, but in another perspective, in a reply by Hector Geffner to a question by Michael Gelfond.

Debates

Ontologies for actions and change

From: Hector Geffner

This is in reply to Michael's message.

As I see it, in the "basic" approaches to the frame problem (Reiter's completion, Sandewall form of chrnological minimization, language $\mathcal{L}$, etc), in one way or another, action rules are compiled into transition functions of the form $f(a, s)$ - where s is a state and a is an action - that describe the set of possible state trajectories. Observations in such models just prune some of the trajectories and hence have a "monotonic" effect (i.e., predictions are not retracted, at most they are made inconsistent).

In other models, Michael's and Luís's included, actions are represented in the state (in one way or the other) and hence abdution to both fluents and actions are supported. Such models *are* non-monotonic in the set of observations. Actually the only apparent difference in such models between actions and fluents is that the former are assumed to be "false by default" while the latter are assumed "to persist by default".

Interestingly, there seems to be another difference between actions and fluents in those models, and that is, that actions, unlike fluents, are not allowed to appear in the head of rules. Actually I'm not sure whether this is the case in all such models, but it is true at least in my AAAI-96 paper. The reason I excluded actions from rule heads was precisely "to prevent actions from having an effect on beliefs about the past" (just think of a rule like **hungry then eat**). Again "the causality principle".

I wonder now what's the reason the same constraint is in force in most other models of such type (if that's so).

Any ideas?

Hector Geffner

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`http://www.ida.liu.se/ext/etai/actions/njl/`