ELECTRONIC NEWSLETTER ON
REASONING ABOUT ACTIONS AND CHANGE

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Today

One more reference article is advertised today, this time by Patrick Doherty and his co-workers and describing their language tradition TAL. Also today, Tom Costello has a question to Graham White regarding his article on "Simulation, Ramification, and Linear Logic" that was advertised on September 21.

ETAI Publications

Received research articles

TAL: Temporal Action Logics Language Specification and Tutorial

by Patrick Doherty, Joakim Gustafsson, Lars Karlsson, and Jonas Kvarnström

Abstract: The purpose of this article is to provide a uniform, lightweight language specification and tutorial for a class of temporal logics for reasoning about action and change that has been developed by our group during the period 1994-1998. The class of logics are collected under the name TAL, an acronym for `Temporal Action Logics`. TAL has its origins and inspiration in the work with Features and Fluents (FF) by Sandewall, but has diverged from the methodology and approach through the years. We first discuss distinctions and compatibility with FF, move on to the lightweight language specification, and then present a tutorial in terms of an excursion through the different parts of a relatively complex narrative defined using TAL. We conclude with an annotated list of published work from our group.

The article tries to strike a reasonable balance between detail and readability, making a number of simplifications regarding narrative syntax and translation to a base logical language. Full details are available in numerous technical reports and articles which are listed in the final section of this article.

Discussion about received articles

Simulation, Ramification, and Linear Logic

by **Graham White**

Comment from: **Tom Costello**

Dear Graham

On page 2 of your article, "Simulation, Ramification, and Linear Logic" you suggest that effect axioms should have Σ_1 antecedents and frame axioms Π_1 antecedents, based on intuitions concerning locality. However, some local properties, such as there being no block in a certain place are expressed as Π_1 formulas, not as Σ_1 formulas, e.g. $\forall(b, \neg at(b,l))$ states that there is no block at location l.

It seems to me that many effect axioms will have preconditions that say that the effect will occur in certain circumstances, unless there is something that prevents it. This is naturally written as a Π_1 formula. Consider the Blocksworld. One effect axiom there can be written

$$\begin{aligned} &\forall bls[\forall b'[\neg On(b', top(b), s)] \wedge \\ &\qquad \forall b'[\neg On(b', l, s)] \wedge \\ &\qquad top(b) \neq l \rightarrow \\ &\quad On(b, l, move(b, l, s))] \end{aligned}$$

The left hand side side of this effect axiom is clearly equivalent to a Π_1 formula. It seems that many preconditions will have this form. This seems to contradict your intuitions that effect axioms have Σ_1 antecedents, and that *sufficient* conditions can be written in Σ_1.

Yours,

Tom Costello

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