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Today

The discussion between Eugenia Ternovskaia and the authors Marc Denecker, Daniele Theseider Dupre, and Kristof Van Belleghem has referred several times to the work of Michael Thielscher on the same general topic, i.e. on ramification. Today we have his comments to the discussion.

ETAI Publications

Discussion about received articles

An Inductive Definition Approach to Ramifications

by Marc Denecker, Daniele Theseider Dupré, and Kristof Van Belleghem

Comment from: Michael Thielscher

Dear Eugenia, Marc, Daniele, Christoph,

I'd like to second Eugenia's view on the "Counter" counter-example, which implies that the intended behavior can be obtained after all with my approach. The natural "inter-state constraint" in this example would be

$$\neg Holds(out, s) \wedge Holds(out, do(a, s)) \wedge Holds(count(n), s)$$
$$\rightarrow Holds(count(n+1), do(a, s))$$

(in conjunction with $Holds(count(m), s) \wedge Holds(count(n), s) \rightarrow m = n$)

Then if you consider the causal relationship

$$out \text{ causes } count(n+1) \text{ if } count(n)$$

(in conjunction with $count(n)$ causes $\neg count(m)$ if $m \neq n$)

the only consistent successor state would show the expected increment of the counter by one. (A side remark: Inter-state constraints like the above can be expressed in a novel Situation Calculus-style formulation of the Fluent Calculus; if you're interested, have a look at

http://pikas.inf.tu-dresden.de/~mit/publications/conferences/JELIA98.ps)

You have raised an interesting question in this context, namely, whether and how causal relationships can be extracted from such inter-state constraints. The current procedure is not directly applicable because it is based on formulas without situation or time argument. My feeling is that a generalization must be possible–there definitely is a formal correspondence between the above state constraint and the causal relationship–but working out the details will require some brain work.

Cheers.
Michael

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