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Today

Today, the first question to David Poole regarding his ETAI submitted article "Decision Theory, the Situation Calculus and Conditional Plans". Also, a continuation of the dialogue between Marc Denecker, Daniele Theseider Dupré and Kristof Van Belleghem on one hand and Eugenia Ternovskaia on the other concerning the ETAI submitted article of the former, An Inductive Definition Approach to Ramifications.

ETAI Publications

Discussion about received articles

Decision Theory, the Situation Calculus and Conditional Plans

by David Poole

Comment from: **Uffe Kjærulff**

The focus of the paper seems to be on representational issues, which is fine. But, being a Bayesian-network person, I'm would find it interesting to see how computations of expected utilities of plans are performed in the ICL framework. This issue is only touched upon very briefly in the paper, mentioning that it involves enumerating all possible cases. In my understanding that amounts to constructing the corresponding decision tree (which may be huge), and then computing the probability and utility for each leaf of the tree.

So, my question boils down to: Is there an efficient computational scheme for ICL?

Uffe Kjærulff

Dept. of Computer Science, Aalborg University, Denmark

An Inductive Definition Approach to Ramifications

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

Comment from: **authors**

Dear Eugenia,

Here are some thought about your comments.

> > The rules imply a state constraint relating any two consecutive states. This constraint is perfectly valid.
>
> It seems there is just a misunderstanding about terminology here. We use the term "state constraint" to mean a relation between fluents within any one state, not between different states (see also the definition in the paper). As such the term corresponds to for example Reiter's and Shanahan's notions of state constraint and Thielscher's and Lifschitz's notions of domain constraint (to name just a few). We were not aware of a different use of these terms in the literature.

This is true, I have not seen this wider notion of a state constraint in the literature either. However, Chitta Baral and Ray Reiter used this term in a conversation recently. I do not see a reason why this wider notion could not be used as well.

Even if we choose not to extend the notion of a state constraint, it's hard for me to see in what way your observation would imply any interesting theoretical consequences. It seems obvious that a causal rule imply universal statements about situations (states) involving as many states as there are those mentioned in the causal rule. Your "counter" example only shows that there are indirect effects of actions depending on two consecutive states, not just one. It's hard to disagree. All causal rules of this king will imply universal statements about two consecutive states, not about just one, of course.

Recall that our opinion of the current state of the art was that effect rules were much perceived as tightly coupled to state constraints (in the narrow sense; i.e. statements relating properties at the same time point). In any case, if one looks at current work on ramification, then usually effect rules imply state constraints (like in Lin's approach), or their semantics is determined by state constraints (like in Thielschers approach).

The role of our counterexample was simply to show that there may be no such relation.

What are interesting theoretical consequences? We do not point to some interesting new and fundamental relationship; actually we cut one: in general an effect rule may be unrelated to state constraints (but this was never your viewpoint anyway, right?). But there is a gain: the effect propagation can be described mathematically independently of state constraints and also of time topology, action preconditions, initial states, etc..

But yes, also to us

"it seems obvious that a causal rule imply universal statements about situations (states) involving as many states as there are those mentioned in the causal rule."

An interesting question generated by your remark is whether Thielscher's approach to derive causal rules from state constraints (about one state) and dependency information can be generalised to "constraints between states" (plus dependency information as far as needed).

Regarding Definition 1, I do not remember whether you define what a literal is. Maybe I just missed it. When I was reading the definition, I did not assume that $\{t\}$ and $\{f\}$ can be literals. In the definition, you *say "and body B a nonempty set of positive and negative literals of D". I understood that you take positive and negative literals of D, leaving $\{t\}$ and $\{f\}$ out because they are are* not *literals. This contradicted to the discussion below. Of course I figured out what you mean, and then wrote to you thinking that a little rewording would help the reader.*

We will take care to clarify this in the text. Thanks.

Thanks for pursuing this discussion, Eugenia.

Marc, Daniele, Kristof

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