ELECTRONIC NEWSLETTER ON REASONING ABOUT ACTIONS AND CHANGE

Issue 98085 Editor: Erik Sandewall 22.12.1998

Today

Cervesato et al Article Accepted

The article by Iliano Cervesato, Massimo Franceschet, and Angelo Montanari has now been accepted after reviewing and refereeing. Congratulations to the authors! We remember that the open review debate was quite thorough, with detailed questions by Paolo Liberatore, Peter Jonsson, and Rob Miller, and extensive answers by the authors. This is what most of all contributes to the quality processes of our journal - and to the public recognition and confidence in it.

In the present issue we also have a question by Chitta Baral to Hector Geffner, concerning some of his remarks in the discussion with David Poole about David's submitted article.

Also, Erik Sandewall has a few questions to Johan van Benthem, for his contribution to the discussion on ontologies of time.

This will be the last issue of the ENRAC for 1998. We have had a very interesting year, and many thanks to all who contributed articles and discussion items. The next issue will appear some time after January 10.

ETAI Publications

Discussion about received articles

Decision Theory, the Situation Calculus and Conditional Plans

by **David Poole**

Comment from: Chitta Baral

Hi Hector and David:

I have read your exchanges in the ENRAC about the importance of POMDPs in *decision problems involving sensing*. I have the following two questions to Hector.

(i) I think POMDPs are very good for this particular type of problems. However, I am not sure they scale up in the following sense: If we elaborate *sensing* as obtaining knowledge then when we consider obtaining knowledge of the form $(KKKf)$ where K is the modal opeartor 'knows'. I am not sure if a POMDP based approach can scale upto this.

On the other hand it seems that the approach in Bachus, Levesque and Halpern (IJCAI 95) can scale up to this and they can be shown equivalent to a POMDP based approach in the special case where we only deal with one level of knowledge. (eg: S5 guarantees that.)

(ii) I don't understand why (perhaps you can help me here), in a POMDP formulation (for example, in Hector's AAAI fall symposium paper this year) we have the action a mentioned in $P_a(o \mid s)$. I feel it should not matter how s was reached, and we should just have $P(o \mid s)$. Otherwise observations are in some sense non-Markovian, as they not only depend on the state of the world, but also how that state was reached. (This is not that big a deal though.)

Best regards
Chitta

Debates

Ontologies for time

Dear Johan,

Thank you for your very insightful note for the discussion about ontologies of time. Here are a few questions on this topic.

1. You point at the fact that some predicates are such that they intrinsically only apply to intervals. True, but some of the proposed instances of the DI problem are formulated for predicates that do apply to points without problems, for example, Galton's example with the red an the green lamp in the traffic light. (One may argue that lightbulbs 'really' have intermediate states where they glow without shining, but whatever state they have they do have it at timepoints). Ought we not deal with those problems first?

2. a) With respect to the "good luck" re using Real Time: after all, zillions of engineers and scientists in physics and engineering sciences use Real Time and are happily unaware of any complications in that respect. If they can do so, why can't we? and more precisely, what is the Bad that can happen if we follow their suit?

   b) Continuing (a): *if* we decide that Real Time is Good Enough for us, does the Dividing Instant problem then apply, or is it irrelevant?

3. Re the axiomatic vs intended models approach: I must admit I don't feel at home with either, the way I read your distinction in section 5. The axiomatic approach *requires* one to specify axioms for the chosen temporal domain, for example, for the reals in case these are chosen as timepoints? The intended structure approach, on the other hand, seems to require or at least suggest that *the structure* is constructed from timepoints, intervals, and so on, and thereby that it implements a solution to the DI.

   The approach I suggested in the discussion, and for which I asked in vain for an explanation of why and where it would get into trouble, was to take the time domain as given (real numbers), to axiomatize the statements about the chronicle i.e. the events but not the time domain itself, and to obtain the *models* (plural, potentially) for those axioms. Then the undefinedness of some predicates at the dividing instants would be represented by having several models, but in each model each predicate would be either of true or false. I guess you

> could say that in this case the intended structure is a set of models, but did you intend that reading?

Best regards,
Erik
