ELECTRONIC NEWSLETTER ON REASONING ABOUT ACTIONS AND CHANGE

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Today

Murray Shanahan's submitted article has now been accepted for the ETAI. The present Newsletter contains the referee reports; one of them also brings up a policy issue for which there is a comment by the present area editor. The policy question concerns the balance between placing commentary material in the question/answer review dialogue and placing it in the article itself. Should ETAI style electronic publishing make it possible to cut down on the breadth of commentary material in our articles?

We also have a comment by Murray Shanahan on another policy question, raised by an Anonymous Referee a few days ago, namely whether it is appropriate to debate referee reports. Finally a comment (called by him a 'grumble') by John McCarthy concerning the reference article by Levesque, Pirri, and Reiter.

ETAI Publications

Discussion about received articles

A Logical Account of the Common Sense Informatic Situation for a Mobile Robot

by **Murray Shanahan**

Comment from: **Anonymous referee 1**

Much of the work in the paper has already been published. That's not a criticism, since it is signaled by the author himself, but the paper seems to initiate a third kind of article in the ETAI, between reference papers and crisp new results. I took a real interest reading it, because it collects a bunch of results into a single framework. Showing how those fragments, considered as specifying pieces of a common task, can consistently work together and can help mastering the architecture of a reasoning robot is, according to me, a real contribution worthy of publication in the ETAI (parenthetically, this contribution could be more neatly stated in the abstract).

The discussion with Paolo Eduardo Santos and Chitta Baral has been extensive and several points have been improved. Here under are some more suggestions, which are not conditions to the publication, but that Murray Shanahan can follow if he feels they are improvements.

- In part 4, I suggest: "a region is *an open (path)-connected* subset of $R \times R$ ... Objects occupy regions". That's a more standard definition of region, which is not a synonymous of subset in standard math. Moreover, with the present definition, according to (Bo1) p16, a closed set has an empty boundary.

- while the reader can understand what is meant by a direction, the definitions could be more precise. In (SP3), since *Bearing* is real-valued, it is not a function (it is only defined modulo 360) and is not defined if $P1 = P2$. It is then unclear in (SP4) if $P1$ belongs to $line(P1, P2)$, while $P2$ does. On the other hand, in axioms (H1)...(H3) p12, the modulo arithmetic is implicit, and e.g. the bearing value -10 can not be replaced by +350 in the inequalities.

I suggest to point that a bearing is in fact an equivalence class which may be represented by any of its members, without further developments. (SP3) could then be simplified to :

$$Bearing(P1, P) - Bearing(P2, P) = 180[mod 360]$$

(and including the end points if prefered). Also, the definition of intervals in (H1)...(H3) could be left to the reader's background knowledge.

- The question raised by Chita Baral about touching triangles in (B6) can be solved if $PbelongsLine(P1, P2)$ is omitted in the third line of this axiom.

- (Bo5) could be simplified: *Connect(c) is the region g such that* $\forall P2, l[Boundary...]$, *if such a region exist, then empty set else...* I suppose the definition of c is meant to exclude crossed polygons (two lines of c having a common point appart from common end points mentined in the list)

Also in paragraph 3, line 3 of 6., change $Boundary(g, l)$ and in the last line of (Bo5) $\exists P3, z\forall p2...$

- p18, just above (B8): I doubt that the condition for the robot leaping over an obstacle is this one, which does not depend on the size of the robot (if I do not misunderstand the sentence). Could it be clarified which location/circle of uncertainty is relevant ?

- p22 def 7.11 I suggest clarifying that MIN is a parameter of the definition.

Comment from: **Anonymous referee 2**

The paper describes interesting results, which have been originally presented at ECAI-96, that researchers working in the area of reasoning on actions and change ought to know about. It is well-written and clear. At some points, where rather natural solutions to specific problems are proposed, the presentation is too turgid.

The following are my answers to the standard referee questions:

1./2. There is a short (10 lines) abstract, but there is not a summary where the main results are specified. I would ask the author to provide it.

3. No.

4. Even though the paper is basically well organized, it can be shorthened. Some general discussions as well as some straightforward proofs, e.g., the proof of Proposition 2.8, can be omitted and/or summarized.

5. The major limitation of the paper is that it is not up-to-date (as reported in its cover page, its last revision dates back to April 1996).

I wish to make the following additional comments regarding policy. One of the major advantages of an electronic journal as ETAI is that it guarantees a rapid publication of new results. In particular, it reduces the delay between the presentation of the results of a research work at a conference and their publication in a journal paper.

I believe that one cannot publish old results without putting them in the current state-of-the-art. In the specific case, I do not think that the proposed contribution has been invalidated by later developments in the field, but I would ask the author to discuss such developments in the paper. My suggestion is to provide an additional section relating the work to what has happened elsewhere since then as well as to its subsequent developments (e.g., the simpler description of the robot's environment, mentioned in an answer to Paulo Eduoardo Santos).

More precisely, I would like to ask the author whether nothing has been published on the subject since then that deserves to be taken into account (if this is his opinion, it must be explicitly formulated). I just mention the subsequents developments of the logical approach proposed by Lesperance et al. (cf. the special issue of the Journal of Logic Programming on Reasoning about Action and Change, as well as the Proceedings of KR'98) and Galton's work on representation and reasoning about spatial knowledge. Furthermore, the paper reports the results of preliminary experimentation with the robot. Has experimentation been systematically executed? What are its outcomes?

Another relevant point: complexity issues are completely neglected in the paper and dealt with rather quickly (and superficially) in one of the interactions with Paulo Eduoardo Santos. I ask the author to briefly discuss them in the paper. In particular, he should at least summarize the known existing results about the (worst-case) complexity of logic-based abduction and circumscription, and explain his opinion about the impact of these complexity results on research in logic-based/cognitive robotics.

Minor point: I would remove from the abstract the sentence about the novel solution to the frame problem (inspired by the work of Kartha and Lifschitz). It seems to me a rather specific technical point (as the author explicitly recognizes in his answer to Chitta Baral), mainly concerned with the adopted formalims rather than with the considered problem. Moreover, if the form of the considered theories actually guarantees that the circumscriptions (almost) always reduce to predicate completions, then I believe that this fact should be explicitly stated.

References: please check/integrate [Charniak & McDermott, 1985], [Miller, 1996], and [Shanahan, 1996].

Comment from: **Area Editor**

The second part of the comments by Anonymous Referee 2 raises an interesting policy question for the ETAI, namely to what extent shall commentary material be placed in the article itself, and to what extent is it better placed in the article's discussion session. With 'commentary' material I include comparison to related work that occurred concurrently with or after then work being reported in the article; discussions of alternative ways of realizing subsystems of a largeer system being presented in the article; discussion of intrinsic theoretical limitations of the proposed approach; and so forth.

The A I literature has traditionally required fairly extensive consideration of commentary material. This is clear in comparison with other fields, such as physics, where articles usually seem to be much more focussed on a single mission: define the problem, discuss the state of the art relating to this problem, present the new solution, done.

The emergence through ETAI of a systematically maintained dialogue connected to each article offers an alternative approach: instead of the author trying to answer all questions about the topic that some readers might ask, he or she could focus on the main problem that's being addressed and on its solution, and leave the rest to the question period. A change in this direction would have its pros and cons. The advantages are in the increased flexiblity and the possibility of adding material over time, even after the date the article appeared in the journal. The disadvantage might lie in a possible loss of systematicity, and in the resistance among readers against changing old habits.

As the second half of the statement by Anonymous Referee 2 is a suggestion for including several types of commentary into the article, it would be possible syntactically to rephrase most of these suggestions into questions that the author could answer in the discussion page. Whether it is better to answer the questions this way or by amendments in the article itself may be a matter of debate, and it would be useful to have a decision about a recommended policy in this respect.

Since the same question is likely to come up at other times, I will ask the ETAI policy committee and our area editorial committee to study it and to make a recommendation. Comments by subscribers are invited.

For the time being and for the present article, I will ask the author, Murray Shanahan, to consider the second half of the referee statement as a set of questions that can be answered either by amendments to the article, or through the review dialogue. Based on the referee reports, the article is accepted for the ETAI while giving the author an option of minor modifications in response to the suggestions by both the anonymous referees.

Introduction to the Fluent Calculus

by Michael Thielscher

Comment from: Murray Shanahan

Referee 2 writes,

> *Referees should never be refereed (but judged by editors).*

I strongly disagree with this. I very much support the idea of open refereeing precisely because it means that referees are accountable for their reports. This is the only way to eradicate referees' reports that combine ignorance with arrogance. Many of us have, no doubt, been victims of them.

Now, I can imagine a researcher responding to this view in the following way: "If I'm open to public criticism myself, why should I referee papers? It's hard work, it's a nuisance, and it's voluntary. So I won't bother any more." The answer is that reviewing is not a favour, but a duty. All of us who contribute papers ourselves and expect them to be well refereed have a duty to referee other papers, and to do so with the utmost professionalism.

Foundations for the Situation Calculus

by Hector Levesque, Fiora Pirri, and Ray Reiter

Comment from: John McCarthy

I have a grumble about the title of the article by Reiter, et. al. about situation calculus. It presents a particular system of the situation calculus, and therefore can't quite serve as a reference article.

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