ELECTRONIC NEWSLETTER ON REASONING ABOUT ACTIONS AND CHANGE

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Today

The refereeing of several articles has been concluded during the last few weeks, and is reported in today's Newsletter. We have the pleasure to announce the acceptance of three articles after the standard process of discussion, revision, and refereeing, namely the article by David Poole, the reference article by Patrick Doherty et al, and the reference article by Erik Sandewall. The refereeing for the last one has been organized in its entirety by Susanne Biundo (who is area editor for "Planning and Scheduling"). – The referee reports for these three articles follow below.

Chitta Baral and Son Cao Tran have made an addition to their article, the acceptance of which was reported in the previous Newsletter. The addition was made in response to suggestions by Anonymous Referee 2.

The reviewing of the submitted reference articles has now been concluded. We hope that authors will make use of the option of submitting articles where the customary introductory definitions can be replaced by a reference to the appropriate reference article.

Anonymous Referee 2 for the article by Baral and Cao Tran has requested that a clarifying addition be made to his referee statement. It has been installed into the webpage structure.

ETAI Publications

Discussion about received articles

Decision Theory, the Situation Calculus and Conditional Plans

by **David Poole**

Comment from: **Anonymous Referee 1**

Review form

1. Are the results of the article, as specified in the summary, of significant interest for researchers in our area?

The themes considered in the paper are of great interest.

2. Does the full text substantiate the claims made in the summary?

There are many claims, many lacking precision and clarity. The paper delivers on some of them (see below).

3. Is the text intelligible and concise?

The main ideas in the paper are intelligible, but the presentation is often confusing (see below).

4. Do you know of any previous publication of the same result?

No.

5. Are there any other considerations that may affect the decision?

No.

More detailed comments

Based on my understanding, the best way to describe the paper is as proposing a way of representing actions, probabilities, utilities, sensors, and conditional plans in logic programs where:

- actions are represented using a situation calculus formulation close to Reiter's
- probabilities are represented by treating certain atoms in special way: the truth of certain combinations of atoms (choices) is set externally, not by the logic program
- utilities are represented by a "utility" predicate, defined in the logic program
- sensors are defined by a "sensing" predicate, defined in the logic program
- conditional plans are defined following the ideas of Levesque but are interpreted using the "sensing" predicate, rather than "knowledge" fluents

Once a logic program is defined along these lines and certain conditions hold, the expected utility of conditional plans is well defined. There are also hints about how to compute this expected utities by building suitable "explanations", by this is not explained in detail.

This would be good enough. The main problem is that the author does not see and does not present the paper in this way.

He sees the logic program in which the truth of certain combinations of atoms is defined externally as an "independent choice logic", a logic that is "based on Bayesian decision theory". He also says that the paper proposes "a new model; not an alternative to POMDPs, Bayesian Networks, logic programs, and the standard situation calculus, but a way to combine them", etc.

I think this is quite confusing.

Personally, I'd also prefer less general discussion about decision theory, logic, uncertainty, etc; and more details on the procedure for evaluating the expected utilities of plans and its performance over some examples.

Comment from: **Anonymous Referee 2**

Answers to the Refereeing Questions

1. Are the results of the article, as specified in the summary, of significant interest for researchers in our area?

Yes, definitely.

2. Does the full text substantiate the claims made in the summary?

Yes, fully.

3. Is the text intelligible and concise?

Intelligible: yes. Concise: yes and no; see below.

4. Do you know of any previous publication of the same result?

No.

5. Are there any other considerations that may affect the decision?

None.

General remark. The article is lucid, well written, and easy to understand. It is relatively long (40 pages), but this is necessary for covering the topic it sets out for: to propose an integration of the author's "independent choice logic" with a variety of Toronto situation calculus, including background, definitions, examples, and comparisons with other approaches. Everyone may not agree with the approach, but it is a valuable contribution.

Relating Theories of Actions and Reactive Control

by **Chitta Baral and Son Cao Tran**

Comment from: **The Authors**

The comments of the anonymous reviewers were very useful. We would like to especially thank the second reviewer for pointing us towards the discrete event dynamic system (DEDS) literature and the similarity between our notion of maintainance and the notion of stability there.

We have now modified our paper by discussing this similarity and adding a few references to the literature in DEDS.

Chitta and Son

The authors have provided a summary of the changes, which is available from the papers review discussion webpage.

TAL: Temporal Action Logics Language Specification and Tutorial

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

Comment from: **Anonymous Referee 1**

1. *Does the article represent a tradition or "approach" where there is already a sufficient volume of work in the field?*

Yes.

2. *Does the article concisely specify the assumptions, motivations, and notations used in that approach? Does it correctly capture the assumptions, etc. that have been used and are being used?*

Yes. Note, however, that these notations etc. are fairly complex.

3. *Would reading the present article enable one to skip the introductory definitions section of many previously published articles that used the approach?*

Yes. However, the length of the article (32 pages) makes it unlikely that the same text would ever have been included as a part of another article.

4. *Is the article also concise in the sense that it does not contain a lot of material that is unnecessary for the above criteria?*

One would hope that it is sometimes possible to make do with a shorter introduction to the approach than this one. An article giving a full account of the approach couldn't have been much shorter, however.

5. *Is the article pedagogical and sufficiently easy to read, but at the same time precise and correct?*

Yes.

Comment from: **Anonymous Referee 2**

I suggest to accept the article. Here is how I feel it conforms to the various criteria for reference articles:

1. *Does the article represent a tradition or "approach" where there is already a sufficient volume of work in the field?*

Yes, as is also shown in the article. Moreover it is a very active approach, with a rapidly growing volume of work.

2. *Does the article concisely specify the assumptions, motivations, and notations used in that approach? Does it correctly capture the assumptions, etc. that have been used and are being used?*

Yes concerning assumptions and notations. The article gives a very clear specification of TAL and in addition a nice "user manual". Motivations for the types of language statements and an explanation how the logics deal with the frame/qualification/ramification problems could be more elaborate: in this respect the article relies heavily on e.g. "Features and Fluents". However, I suppose it is acceptable for the article to rely on what the authors call its companion article (reference [29], on Cognitive Robotics Logic, by Erik Sandewall).

3. *Would reading the present article enable one to skip the introductory definitions section of many previously published articles that used the approach?*

Yes, under the same assumption as above.

4. *Is the article also concise in the sense that it does not contain a lot of material that is unnecessary for the above criteria?*

Yes.

5. *Is the article pedagogical and sufficiently easy to read, but at the same time precise and correct?*

Yes.

Cognitive Robotics Logic and its Metatheory: Features and Fluents Revisited

by **Erik Sandewall**

Comment from: **Anonymous Referee 1**

I have checked the article against the refereeing criteria for reference articles:

1. *Does the article represent a tradition or "approach" where there is already a sufficient volume of work in the field?*

Yes. The article well summarizes research that has been done by Sandewall and his group over the last ten years.

2. *Does the article concisely specify the assumptions, motivations, and notations used in that approach? Does it correctly capture the assumptions, etc. that have been used and are being used?*

Yes. Though clear from the context, I would clearly state the meaning of the predicate $D([s,t],s)$ used at page 8.

3. *Would reading the present article enable one to skip the introductory definitions section of many previously published articles that used the approach?*

Yes.

4. *Is the article also concise in the sense that it does not contain a lot of material that is unnecessary for the above criteria?*

Yes.

5. *Is the article pedagogical and sufficiently easy to read, but at the same time precise and correct?*

Yes.

Comment from: **Anonymous Referee 2**

General Remarks

The paper is certainly acceptable as a reference article for the features and fluents approach, and meets all the relevant criteria.

I think it could be improved with the addition of a few examples. In particular, I think it would be an easier to read if a couple of examples of action laws were introduced, for standard benchmark scenarios. In fact, I don't think the form of an action law is ever defined.

It's a shame about the plethora of different ways of writing the same thing. This is quite confusing for the reader.

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`http://www.ida.liu.se/ext/etai/actions/njl/`