ELECTRONIC NEWSLETTER ON REASONING ABOUT ACTIONS AND CHANGE

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Today

Today, a contribution by Doherty re the Amir article at FCS-98.

Discussions

Discussions about Articles at Commonsense workshop

Additional contributions have been received for the discussions about the following article(s). For the full context, please refer to the on-line structure which contains one article interaction page with the entire discussion for each article.

Point-Sensitive Circumscription

by Eyal Amir

From: Patrick Doherty

Hi Eyal,

A few comments regarding your paper and then a few regarding your comments to Erik. First, your paper:

First off, I think your notion of Pt-Sens circumscription is an interesting technical result, but wonder about its widespread applicability (see comments below). The "counter-intuitive example" (your description) you provide as a reason for proposing Pt-Sens circumscription would appear to be more counter-intuitive in the way the policy is set up rather than in the result. The reason for introducing pointwise circumscription in the first place **is** so that one can vary **parts** of an extension while fixing other parts. To introduce a policy where you vary the whole extension of the predicate you are minimizing strikes me as being a bit extreme. But, I suppose one could find more intuitive "counter-intuitive" examples to prove your case, which do not violate one's sense of proper use of pointwise circumscription (if there is such a thing!)

You also state in section 7 that

> *pointwise circumscription is sufficient if we restrict ourselves to deterministic actions and to cases in which there are no domain constraints.*

Well, the K-IA class deals with non-deterministic actions just fine and in the case of PMON, or its extension PMON(RC) discussed below, where ramification can be dealt with using a combination of domain and dependency constraints, syntactic characterizations for both can be defined using pointwise circumscription. Although it is computationally more feasible to choose a different type of circumscription. You can check my ecai94 paper or the paper by gustafsson and myself in kr96. In fact, I think you attended the ijcai97 workshop where I demonstrated PMON(RC).

In conclusion, I enjoyed the first part of the paper, but I'd think the second part regarding applications to logics of action and change needs some more work (By the way, I have only read your workshop draft, so you may have fixed things since.)

Now some comments about your and Erik's interaction:

> *Pointwise Circumscription (I shall abbreviate it here Pt-Circ) is a special case of Point-Sensitive Circumscription (abbreviated here Pt-Sens), and so PCM can be expressed in Pt-Sens the same way [c-ictl-94-82] shows with Pt-Circ. However, Doherty and Lukaszewicz showed that Pt-Circ expresses PCM only for the ontological class Kp-IAex, in which no observations later than time t_0 are allowed.*

The point is that PCM is limited to the class Kp-IAex, and Pt-Circ was used to provide a syntactic characterization of PCM's minimization policy, not that Pt-Circ is inherently unable to represent classes which subsume Kp-IAex.

> *My claim was that we may be able to avoid filtering (the way [c-ictl-94-82] does) in grasping K-IA.*

I did not prove that either. Future work?...

Why would you want to avoid filtering? And, if there is a legitimate reason, I would imagine you'd want to replace pointwise circumscription with a more computationally efficient policy than a generalization of generalized pointwise circumscription which is what Pt-Sens appears to be.

> *You also discuss a simple case of ramification using the duality between the* dead *and* alive *properties. This of course is not within K-IA, as you also observe. However, there are certainly known methods that handle such simple ramifications (as well somewhat less trivial ones) correctly and that have been expressed or re-expressed using pointwise circumscription.*
>
> > Although the simple example I gave is within K-IA, I support the claim that Pt-Sens can treat some forms of ramification (a first hint at that was made in a paper of mine in NRAC'97). I am not aware of previous expressions of ramifications using Pt-Circ and will be happy to get some pointers.

In the KR96 paper by Gustafsson and myself, we introduce a straightforward technique to extend PMON, which is assessed correct for the K-IA class, so that it deals with a broad class of problems associated with ramification. This logic PMON(RC) subsumes K-IA. The minimization policy is practically the same as PMON and can trivially be defined using pointwise circumscription, although we use standard predicate circumscription (in fact predicate completion). In fact, we model both the stuffy room example from Winslett and the alive/walking example in the paper. There are many more examples that you can test using the VITAL tool which I demonstrated at IJCAI97.

regards,

Patrick Doherty

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