Thank you for your particularly deep insights on our work. Your main concern seems to be whether we can formulate our problem in existing frameworks. Indeed, those you mention are highly related. Non-deterministic planners such as PKS are not appropriate because they must guarantee success (so called strong plans)– such guarantees are not always possible in incomplete domains. Bryce’s TR shows how to formulate the problems as probabilistic conformant planning and he applies both PFF and POND with poor results. Incorporating questions leads to a POMDP with questionable scalability. Trevizan’s work can be seen as parameter uncertainty and ours is structure uncertainty.

The IPC evaluation problems were selected for their plausibility (not necessarily their structure). Bryce’s version of pathways is motivated by actual biological problems, see:

Ashish Choudhary, Aniruddha Datta, Michael L. Bittner, and Edward R. Dougherty “Intervention in a family of Boolean networks” *Bioinformatics (2006) 22(2): 226-232*

Thank you for your careful review.

In copying Weber & Bryce’s example, we mistakenly omitted del(b)={p}.

Alg1 Line 9 permits uniform treatment of failure in line 11 with the case that filtering an observation indicates failure in line 6. Existentially quantifying over fail in line 12 is (as commonly using in BDDs) is defined \phi |\_{fail} \vee \phi |\_{\neg fail}, where \phi |\_{fail} is obtained by replacing each occurrence of fail in \phi with true (and likewise for \neg fail).

If \delta = (del(b,q) \wedge pre(c,q)), then \delta \models d(\pi) and \delta \models del(b,q)

A diagnosis is defined by de Kleer et.al. ’92, as an implicant of the failure explanation. See the Bryce TR Sec. 4.1 for discussion. We assume that \delta is a minimal diagnosis (per de Kleer), meaning it is a prime implicant.

Q\_F = F, Q\_pi are those relevant to the plan.

Thank you for your positive review. The Weber and Bryce ICAPS paper is at:

<http://digital.cs.usu.edu/~danbryce/papers/WeberBryceICAPS11.pdf>

The Bryce TR is at:

<http://digital.cs.usu.edu/~danbryce/papers/USU-CS-TR-11-001.pdf>

The novel aspects of our submission surround the analysis of plans to identify relevant questions. Planning and acting was first presented by Weber and Bryce in ICAPS11. Our approach is motivated by probing strategies in model based diagnosis, but when applied to plans it requires handling the fact that we may re-plan (i.e., the model will change), unlike MBD.

In the example, a has a possible add effect and a possible delete effect. In general, we may start with every proposition as a possible add or delete (a focus of our ongoing work). It should be that pre(b) = {p}, which would make del(a,p) relevant to the failure explanation.

If the action has only a possible effect, then the state may not change if the action succeeds.