D3WA+: A Case Study of XAIP in a Model Acquisition Task for Dialogue Planning

Sarath Sreedharan *
Tathagata Chakraborti *
Christian Muise
Yasaman Khazaeni
Subbarao Kambhampati

Declarative modeling provides exponential scaleup in the sophistication of dialogue agents BUT

Variables
What does the bot need to keep track of?
e.g. the user's account number

Actions
What can the bot do?
e.g. talk to an user or look up a link

The D3WA Journey

D3WA compiles this information into the full dialogue tree of the bot.

Q1 Why is this there no solution?

Tanya has ended up with a specification with no solution.

Solvable Minimal Abstraction. She is presented with the minimal model abstraction to debug. The level of abstraction is identified through a search over a lattice of abstraction (Sreedharan et al. 2019).

Exemplary Failure in Maximal Abstraction. She is also shown the failure of an exemplary plan trace in a maximally abstract model where the problem is solvable. The failure is demonstrated on the minimal model.

Unachievable Subgoal. Finally a subgoal not achievable in the minimal model is shown, abstracted from either the delete relaxation or identified from the last fluent introduced in the search.

Q2 Why is this not a solution?

Tanya raises a partially specified plan they expected: foil.

1. Constrain the model to generate plans that satisfy the foil.
2. Explain why the constrained model is not solvable. Back to Q1.

Q3 Why is this a solution?

Tanya is surprised that a solution she didn't expect is part of the generated dialogue graph.

Not new. The provenance of actions along such a solution of can be communicated through the visualization of causal links [Seegebarth et al. 2012; Chakraborti et al. 2019].