

1 Priority TaskList

1.1 short-term goals + High priority

- Re-read OCUS paper review-style
- Document what has been done + what not + choices
- Re-read SMUS paper and see what we missed and what choices we made in the OCUS (pocus-pas) paper.
- Re-read postponing optimisation paper and see what we missed and what choices we made in the OCUS (pocus-pas) paper.
- Keeping track of the subsets in the same way as we do for OCUS incr
- Ability to zoom-in on explanations generated i.e. *using nested explanations* ?
- Generate the explanation sequence with OCUS with the same cost function as in ECAI

1.2 Long-term goals (low priority)

- Translate the weighted constraints from OUS into an SMUS cnf specification
- setup experiment for quantifying difference in computation of this approach
- Look for a better cost-function defined on the constraints.
- Look for meta-constraints added to the specification
- Define how the nested explanations are constructed: which constraints are activable in the nested explanation reasoning and which can't or are prohibited.
- Present the user with alternative explanations (of the same cost or similar costs)

2 IJCAI

2.1 SMUS

From early experiments we see that SMUS outperforms OUS on CNF instances when they both solve the same problem, i.e. OUS with unit weights on constraints.

1. OUS als SMUS

Experiments Test on a large scale how both systems perform on CNF instances

Theory Re-read SMUS paper and see what we missed and what choices we made in the OCUS (pocus-pas) paper.

2. SMUS als OUS

Implementation Translate the weighted constraints from OUS into an SMUS cnf specification

- Ex: Constraints weighted 10, is implemented as 10 literals which together have to be satisfied in order to use the constraint.

Experiment setup experiment for quantifying difference in computation of this approach

2.2 Postponing optimisation

Experiments from *OCUS* show that postponing optimisation doesn't improve the computation time for building the whole explanation sequence.

Theory Re-read postponing optimisation paper and see what we missed and what choices we made in the OCUS (pocus-pas) paper.

Implementation Keeping track of the subsets in the same way as we do for OCUS incr

2.3 SUDOKU

Sudoku encoding in python notebook in "experiments/03_OMUS/02_OUS/explain_sudoku.ipynb".

Efficiency Explanation generation is slow!

Explanation Quality The cost function defined for explaining generates explanations that can be better. For example, for a given square, the explanation algo, needs to derive a lot of negative literals (i.e. 8) which is cheaper than deriving the positive knowing together with the constraints of the 8 negatives.

Theory [Look for meta-constraints added to the specification](#)

Theory [Look for a better cost-function defined on the constraints.](#)

Future work [Defining a way to learn cost function structures based on the feedback of users?](#)

Implementation [Ability to zoom-in on explanations generated i.e *using nested explanations* ?](#)

2.4 Visualisation

Code for generating the visualisation in python is ready.

Implementation [Generate the explanation sequence with OCUS with the same cost function as in ECAI](#)

2.5 Explanations

Ideas for improving the current OCUS explanations.

2.5.1 Nested explanations

When deriving a fact, try to generate explanation with counterfactual reasoning.

Implementation [Generate nested explanations with OCUS](#)

Theory [Define how the nested explanations are constructed. Which constraints are activable in the nested explanation reasoning and which can't or are prohibited.](#)

- Example: For a given square in the grid. Certain explanations in the puzzles are using 2 bijectives in order to be able to use the information for a third bijectivity. The problem is that the third bijectivity could have been used in the first place, but **wasn't** because the explanation algorithm prohibited from using these constraints.

2.5.2 Alternative explanations - User experiments

See future work of 2.3.

Theory [Present the user with alternative explanations \(of the same cost or similar costs\)](#)

3 FWO

Content to be discussed at the kick-off meeting.