

Graphplan

Assignment 5

Sat-based planning

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1 THE LAST SLIDE IN THE SAT-BASED PLANNING SLIDE SET INTRODUCES SATPLAN, BLACKBOX'S SUCESSOR. BOTH THE BLACKBOX AND SATPLAN PLANNERS COMBINE PLANNING GRAPHS AND SATISFIABILITY. WHAT IS THE DIFFERENCE BETWEEN THE TWO PLANNERS? IN PARTICULAR, WHAT IS MEANT BY "REMOVE SOME UNNECESSARY ACTIONS" IN THE SATPLAN ALGORITHM ON THE FINAL SLIDE? USE THE BOOK AND/OR THE PAPER DESCRIBING SATPLAN TO SUPPORT YOUR ANSWERS TO THE QUESTIONS BELOW.

Blackbox creates a "planning graph" with increasing number of levels. If the graph satisfies a necessary condition for plan existence, the problem is translated into a satisfiability problem containing only actions from the planning graph.

If this problem is satisfiable, the solution is returned.

SATPLAN also creates a "planning graph" with increasing number of levels. But according to the lecture slides no checking happens before transforming the graph into a satisfiability problem (which I am not totally convinced of).

In contrast to Blackbox SATPLAN only uses a subset of the mutex propagations.

After a solution has been found, all unnecessary actions will be removed. Obviously not al-

ways all actions are needed to achieve a goal. If a solver refines a CNF so far that the assignment of a variable (i.e. an action fluent) does not matter for the formula to be satisfiable, then this action is not important for the solution and can thus be removed.