

Abstract

One of the problems solving technique in Artificial Intelligence is planning. Planning is a selection process of a sequence of action that can be used to change initial state into goal state. In solving planning problem, searching algorithm can be used. Simplified Memory-bounded A* is one of a searching algorithm which is guarantee to return an optimal solution if provided memory is at least as large as the number of nodes on the optimal solution path. Heuristic additive is used as estimate cost for this algorithm so it can be implemented into the planning. There are two methods in planning, Forward Planning and Backward Planning. In forward planning, the solution path search will be done from initial state to goal state, while in backward planning it will be done in reverse, from goal state to initial state. Planning as heuristic search is a method that implement heuristic search in planning.

In this final project, SMA* algorithm with heuristic additive as estimate cost is used to solve planning problem for case study blocks-world. Memory limitation on this algorithm will be simulated in an array of nodes. This system will show steps which has chosen by the system to reach goal state, figure out some acts that have been done, count the needed iteration, and shows timing process that is needed by system to finish the problem.

The result of this final project has proved that the implementation of SMA* in Forward Planning and Backward Planning can solve the problem that exist in the blocks-world. For problem with a large number of possible action from initial state and a small number of possible action from goal state, Backward Planning is better because it can found the solution path faster than Forward Planning. The results of this algorithm are optimal compared with Graphplan Algorithm.

Keyword: SMA*, heuristic additive, artificial intelligence, planning, Forward Planning, Backward Planning, blocks-world, goal state, initial state, Graphplan.