

Research Review – A brief history of AI Planning

The AI Planning came from the development in domains such as state-space search, theorem proving and control theory, etc. The history traces back to 1971 when STRIPS, the first planning system, was invented by Fikes and Nilsson, which was modeled based on the General Problem Solver (Newell and Simon, 1961) – A state-search system. The representation language used by STRIPS influenced a lot of later created languages such as the “classical” language and The Action Description Language (Pednault, 1986), and the Problem Domain Description Language (Ghallab et al., 1998).

The early planners in the 1970s dealt with totally ordered action sequences where the problem could be decomposed into sub-problems and the solution could be achieved by combining the sub-solutions. However, this approach, known as linear planning, was found to be even incapable of solving some of the simple problems.

Partial-order planning (POP) became the most popular planning method since 1980s and then lost the popularity in the late 1990s. However, Nguyen and Kambhampati (2001) came up with the REPOP that scales up better than the GRAPHPLAN and performs very well compared to the best state-space planners.

When it comes to the graph-planning systems, we see a lot of variants -- the GRAPHPLAN (Blum and Furst, 1995, 1997) which was orders of magnitude faster than any POP at that time, and other systems such as IPP (Koehler et al., 1997) , STAN (Fox and Long, 1998), and SGP (Weld et al., 1998).

Helmert (2001) finds that the performance of different planning methods varies from different domains. GRAPHPLAN is best suitable at solving NP-hard domains while search-based methods work better in domains where good solutions could be achieved without backtracking.

Planning has been a critical part of AI research since the very beginning. There are also a lot of international conferences that just focus on Planning.