Planning (Lesson 11): Research Review

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In the following report, I summarize and put into context some important developments in the field of Artificial Intelligence (AI) planning, namely STRIPS, ADL, PDDL and GRAPHPLAN. I will heavily borrow from chapter 11 of the AIMA book [1].

The first major automated planning system STRIPS (Stanford Research Institute Problem Solver) was developed by Fikes and Nilson in 1971 at SRI International [2] for robot nativation. The most most influential part of STRIPS is its action representation, which has been the foundation for many other systems since [1]. As an example, ADL, the Action Description Language [3], is an important variant of STRIPS that for instance allows for equality constraints.

In 1998, McDermott et al. presented PDDL, the Planning Domain Definition Language [4], in order to standardize STRIPS and other planning languages. PDDL has become a widely accepted standard within the scientific community to compare results [1], and is furthermore used in competitions of the Conference on Artificial Intelligence Planning Systems (AIPS) [5].

After partial-order planning (not described here) had been "dominating ... 20 years of research" [1], the GRAPHPLAN system [6] developed by Blum and Furst in 1995 brought the field of planning again forward. The GRAPHPLAN algorithm, which was much faster than previous partial-order planners, is based on the concept of a *planning graph* representing a relaxed version of the original problem. Besides of their usage in GRAPHPLAN, those planning graphs can also be used as an efficient tool for creating strong heuristics for state-space search.

References

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