Research Review

STRIPS, a retrospective (Artificial Intelligence 59, 1993)

Richard E. Fikes and Nils J. Nilsson

This paper reviewed the development of the STRIPS (STanford Research Institution Problem Solver) automatic plan generator and execution monitor, which provided a framework for classical planning problems. This project not only contributed to the development of the STRIPS framework, but also provided motivation for the discovery of A* Search, the ABSTRIPS planning system, macro-operator problem solving, "triangle tables" for plan execution, and region-finding scene analysis programs. As the paper suggests, what made the STRIPS design so successful was the integration of state-space heuristic searches, and the ability to prove resolution theorems. This resulted in the key contribution of the project: The STRIPS operator representation, and an algorithm for modeling effects of an operator based on the assumption that a plan operator only affects the aspects of a world explicitly mentioned in the operators add/delete lists. STRIPS was an extremely important hallmark in Artificial Intelligence, and provided the basis for many of the techniques covered in lecture.

The FF Planning System: Fast Plan Generation Through Heuristic Search (Journal of Artificial Intelligence Research, 2001)

Jorg Hoffmann and Bernhard Nebel

This article described the FF (Fast Forward) planning system, a forward state space search that uses a heuristic that ignores delete lists. What interested me the most in this paper was how effective the heuristic method behind the algorithm, but only on a large class of planning tasks – not all planning tasks. The paper had also stated that the search for a way to formally characterize the structure of that particular class of planning tasks was the continuing work that needed to be done. There was also a section that was devoted to describing the example problems within the STRIPS framework, which further goes to show how influential of a framework it was in AI. The GRAPHPLAN heuristic estimator is polynomial.

On the Complexity of Planning in Transportation Domains (6th European Conference on Planning, 2001)

Malte Helmert

Admittedly, a lot of this paper went over my head. It was very interesting, though, to see a section devoted to describing the problem in terms very close to the PDDL framework we reviewed in lecture. From what I gathered, this paper gave more structure to the classes of planning problems that had a domain that dealt with transportation. Reading through the aforementioned section, this paper definitely made me realize how useful a language like PDDL is when communicating and describing planning problems.