**Research Review**

**on historical developments in the field of AI planning and search**

STRIPS, as the **first major planning system**, attempts to find a sequence of operators in a space of world models to transform a given initial world model into a model in which a given goal formula can be proven to be true. **The language STRPS uses has achieved more influences** that the algorithms itself. The Action Description Language(ADL) designed later has made it possible for STRIPS to solve more complicated problems. As a total order planning algorithm, it tries a new action at a specific plan position, which needs to be in a total-order with respect to the plan's other actions. Later, partial-order planning was designed. It can detect conflicts and protect achieved conditions from interference. Partial-order planning then **dominated the next 20 years of research**.

In 1996, UNPOP was developed to attract researchers’ attention from partial-order planning to **state-space planning**. Bonet and Geffner’s Heuristic Search Planner(HSP) was the **first to make state-space search practical for large planning problems**. Then, FF, the most successful state-space searcher to date, FASTDOWNWARD and LAMA has won a lot of competitions and proven that state-space search deserves more research on.

GRAPHPLAN, a **break-through** for field of planning, was **orders of magnitude faster** than the partial-order planners of that time. It can not only be a good algorithm to find good plans itself, but also can **come up with good heuristic for other planners**. Also as a constraint-based approach, SATPLAN was also very well researched. According to Helmert’s analyses, GRAPHPLAN and SATPLAN are best for NP-hard domains. But they have trouble in domains with many objects.

Alongside the history of exploring planning algorithms, lots of approaches has been designed and tested. Researchers are dedicated to find a functional language to represent the problem domain, to design an efficient algorithm to plan and search, to come up with admissible heuristic functions to help search.

*Artificial Intelligence: A Modern Approach* by Norvig and Russell

*STRIPS: A New Approach to the Application of Theorem Proving to Problem Solving.*