Three major AI planning and search breakthroughs are described below:

- **STRIPS**

In the early 1970s, a group of researchers at SRI AI were trying to make a robot navigate and push objects in a multi-room environment. This “simple” problem led to the development of A* search algorithm, and the STRIPS planning system. [1]

STRIPS is a framework to tackle classical planning problems where the world is static and whose state can only be changed by the actions of the agent.The world is represented as a set of formulae in first-order logic. The underlying assumption is that a given relation is left unchanged by an action unless it is explicitly mentioned in the addlist or the deletelist of the action. The precondition list is a conjunction of positive literals, while the add and delete lists are conjunctions of positive or negative literals. STRIPS is simple but served as the basis for other description languages such as ADL (integrated the semantics and expressive power of the situation calculus with the notational and computational benefits of STRIPS [2]) and then PDDL.

- **GRAPHPLAN**

After 20 years dominated of research focused on partial-order planning, a new constraint-based approach, Graphplan, was invented in 1995 [3]. Graphplan always returns a shortest possible partial-order plan, or states that no valid plan exists. It outperformed the best total-order and partial-order planners at the time. Rather than immediately embarking upon a search as in standard planning methods, the algorithm starts by explicitly constructing a compact structure called Planning Graph. A Planning Graph encodes the planning problem in such a way that many useful constraints inherent in the problem become explicitly available to reduce the amount of search needed. Planning Graphs can be constructed quickly: they have polynomial size and can be built in polynomial time.

- **REPOP**

REPOP, published in 2001, put the focus back on partial-order planning. [4] REPOP adapts the techniques responsible for the efficiency of the currently successful planners (distance based heuristics, reachability analysis and disjunctive representations for planning constraints) to improve the efficiency of the UCPOP algorithm. (UCPOP is a widespread implementation of a sound, complete and partial order planner for ADL, released in 1992). REPOP is more flexible and outperformed GraphPlan in several parallelizable domains.

There is still no winner to the planning problem: It depends on the class of problem.

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