# Research Review on Artificial Intelligence Search and Planning

If we want to solve some common scenarios such as robot search paths in a given room, make decision on goods transport or win a chess game, we need to apply search or planning on NSPACE[1]. This space size is so big that we can't use naive search to get result in an idea time.

Since 1960's, extensive research has made on this area. The first try is STRIPS, the first major planning system, and overall control structure was modeled on GPS (General Problem Solver) [2]. The STRIPS has a good language model which called 'classical' language, and in the next decades this language model evolved to **Problem Domain Description Language (PDDL)**, which widely used today.

In the early 1970s, Planners generally considered totally ordered action sequences [3], can be found can't solve very simple problem such as Sussman anomaly[4]. And then in 1975, goal-regression planning was introduced by Waldinger and the underlying idea is partial-order planning, dominate the next 20 years of research and fall on 1990's as faster methods emerged.

In the middle of 1990's, state-space planning become popular as Drew McDermott suggest the ignore-delete-list heuristic. Avrim Blum and Merrick Furst (1995, 1997) revitalized the field of planning with their **GRAPHPLAN** system, which was orders of magnitude faster than the partial-order planners of the time. [5]

Most recently, there has been interest in the representation of plans as **binary decision diagrams**, and widely studied in the hardware verification community.

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[1] https://en.wikipedia.org/wiki/NSPACE

[2] Artificial Intelligence 3 edition, page 393.

[3] Artificial Intelligence 3 edition, page 394.

[4] https://en.wikipedia.org/wiki/Sussman_Anomaly

[5] Artificial Intelligence 3 edition, page 395.