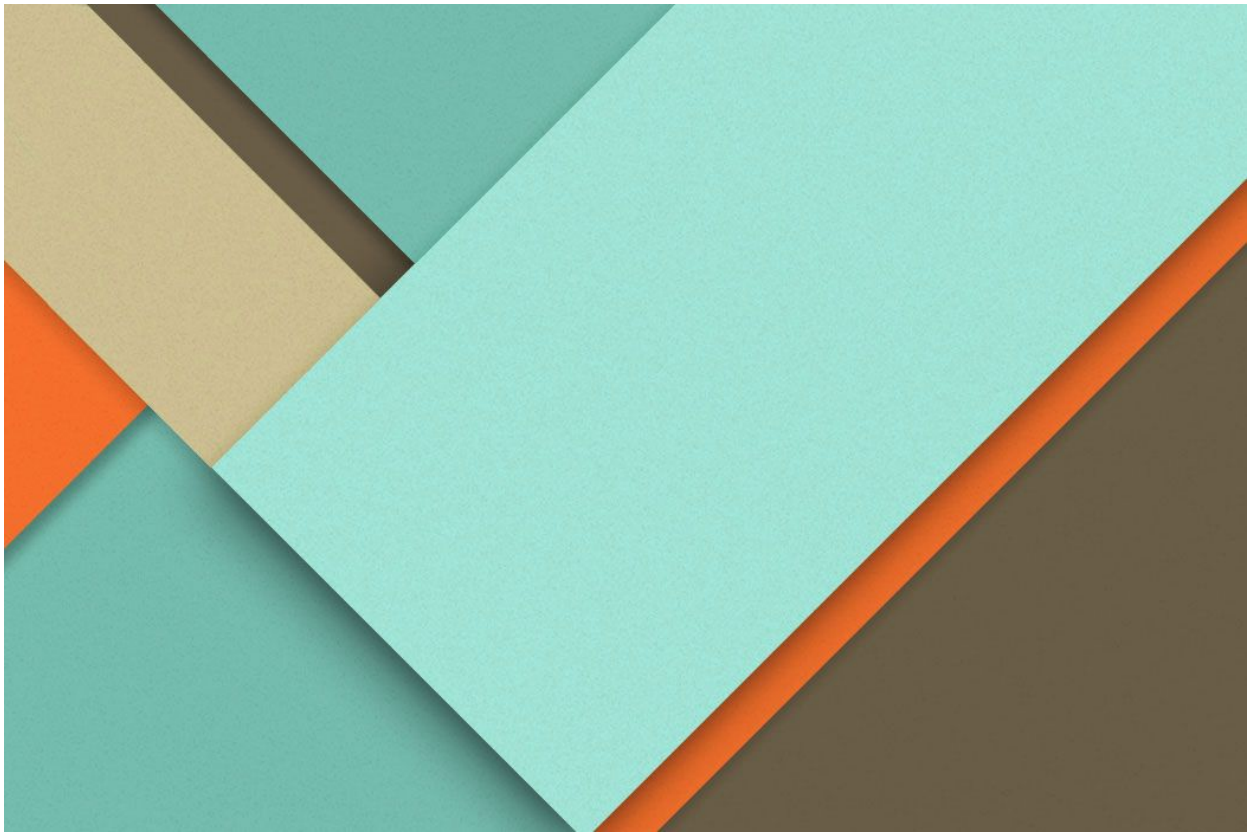

Historical Developments In The Field of AI Planning and Search

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Report's Goal:

In this report, three of historical developments in the field of AI planning and search will be discussed. The relationships between those developments and their impact on the field of AI as a whole will be the highlight of the paper.

First Development:

At Stanford Research Institute, in 1971, Fikes and Nilsson proposed a new approach to theorem proving applications in problem solving. The model attempted to find a sequence of operators in space of world models in order to have the ability to transform the initial world model into a model where the goal actually exists. It models the world as if it were a set of first order predicate formulas that is designed to work with the models that consist of large numbers of formulas [2].

Second Development:

Later in 1997, the paper; fast planning through planning graph, by Blum and Furst, introduced a new approach to planning. This approach was represented in STRIPS-like domains which is based on the construction and the analysis of a compact structure called Planning Graph. A new planner, Graphplan, uses this paradigm. It always returns the shortest plan possible which is partially ordered or states that there is no valid plan [1].

Third Development:

The third development is the heuristic search planner in 1998. A heuristic search generally provides an estimate of the distance to the goal. In the case of HSP algorithm, it estimates the optimal value of the relaxed problem. The algorithm works on transforming the problem into a heuristic search by extracting heuristics from the STRIPS encodings automatically [1].

References:

[1] Blum, A. and Furst, M. (1997). Fast planning through planning graph analysis. *Artificial Intelligence*, 90(1-2), pp.281-300.

[2] Fikes, R. and Nilsson, N. (1971). Strips: A new approach to the application of theorem proving to problem solving. *Artificial Intelligence*, 2(3-4), pp.189-208.