

Research Review on Historical Developments for AI Planning and Search

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The history of artificial intelligence planning and search dates back as far as the 1960s. Since then, there have been major advancements in the field. One of the major goals nowadays, as was back in the past, is to teach robots how to better search a space and plan accordingly. While today we have the compute power to realize more intelligent AI agents, it all started with the premise of how better to model goals and to program them into a machine.

The very first general-purpose robot was named Shakey and was developed by the Stanford Research Institute in the 1960s. This robot had the ability to reason its way through a space based on a set of commands that allowed it to analyze its environment to make better decisions. It was able to perform basic tasks, such as flipping a light switch, opening and closing doors, and pushing objects around a room. This required knowledge in robotics, computer vision, and other AI techniques. As a matter of fact, one of the main results that came from the development of Shakey was the A* search algorithm, which is one of the most popular search algorithms used today. This discovery actually helped solve problems in other problem domains that were not necessarily related to robotics. However, to encode this was not straight forward, thus the development of the planning language called STRIPS. [1]

While the algorithms behind Shakey were very impressive discoveries and are still used today, one of the greatest achievements was the development of STRIPS (Stanford Research Institute Problem Solver). This language allows for developers to lay out states, goals, and sets of actions needed for an agent to use in some environment. For example, if Shakey needed to know how to turn on or off a light in some room, it would need to know the existing state and other possible states that could exist, the goal of Shakey including whether to turn on or off the lights, and a set of actions to achieve these goals which allows movement from state to state. Now STRIPS did have some limitations which didn't allow it to handle more realistic problems. However, this changed with the development of PDDL. [2]

One of the most important improvements in planning technology has been the development of PDDL (Planning Domain Definition Language). This was the first major attempt to standardize AI planning languages so that more people and fields could participate in the development of planning agents. In fact, it was originally made to create the International Planning Competition to further expand participation. By doing this, there became international benchmarks to compare one AI planning agent with the rest. This has helped increase the discovery of new and more powerful techniques at a faster, more competitive pace. [3]

In conclusion, artificial intelligence has been around for a very long time, even before the development of machine learning algorithms and deep learning methods. While today we may not appreciate these past advancements as much, we should pay homage to them as they were the genesis of how we learned to create even more intelligent robots and machines of all sorts. One day it's even likely that the advancements we experience today will be seen as primitive and simple, however they should still be considered strong building blocks that lead to even better and better future innovations.

[1] <http://www.cs.uml.edu/~holly/91.549/readings/629.pdf>

[2] <http://www.primaryobjects.com/2015/11/06/artificial-intelligence-planning-with-strips-a-gentle-introduction/>

[3] <http://icaps-conference.org/ipc2008/deterministic/data/mcdermott-et-al-tr-1998.pdf>