# Research Review of AI Planning and Search Historical Developments

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### Introduction

The automation of planning and search solutions is a key field in Artificial Intelligence (among other fields such as Machine Learning, Computer Vision, etc.). Planning and search AI agents empower automated systems by processing information regarding the initial state that system is concerned with and its desired goals to determine a sequence of actions to execute. Three significant developments have transformed the domain of the AI planning and search: STRIPS, ADL, and PDDL.

### STRIPS

The Stanford Research Institute Problem Solver, also known as STRIPS, is an automated planner developed by Richard Fikes and Nils Nilsson in 1971. This is considered to be the first major planning system developed and was used as the planning component software for Shakey, an autonomous robot that was developed by SRI International. The language that STRIPS created had a huge impact in the field of AI because it created a way to express a wide variety of planning problems while being restrictive enough to allow efficient algorithms to be composed.

### ADL

While STRIPS was a monumental development in describing planning problems in AI, it was not expressive enough to describe some real world domains. As a result, many different languages were developed. Action Description Language, or ADL, was developed by Edwin Pednault in 1986. ADL removed some of the constraints present in STRIPS, such treating unmentioned literals as unknown rather than false. This is representative of an open-world assumption, allowing for expression of more complex planning problems.

### PDDL

STRIPS, ADL, and many other representative languages were combined into one, standardized language called the Planning Domain Definition Language, also known as PDDL. This standardized language was developed by Drew McDermott in 1998 in an effort to launch the International Planning Competition (IPC). PDDL and the IPC series made benchmarking different AI planning agents possible. With each competition, PDDL evolved further to allow for new developments in AI representative languages.