Research Review

This one-page report aims to provide a succinct summary on three of historical developments in AI planning and their impact on the field. Three pieces of work on representation will be discussed, covering the emergence of STRIPS, Action Description Language (ADL), and Problem Domain Description Language (PDDL).

The paper by Fikes and Nilsson, titled “STRIPS: A New Approach to the Application of Theorem Proving to Problem Solving” and published in 1971, introduces STRIPS, one of the early planning systems. To use the author’s own words, the problem solver STRIPS “represents a world model as an arbitrary collection of first-order predicate calculus formulas”. The paper’s representation of actions has had major influence on the field and has been widely adopted by future planning systems.

The STRIPS language is not without shortcomings. The Action Description Language (Pednault, 1986) is proposed to advance STRIPS. ADL improves on STRIPS by relaxing restrictions and adding enhancements on the table, such as the addition of negative literals and disjunctions.

Inspired by STRIPS and ADL among others, the Problem Domain Description Language is a standardization attempt on AI planning languages. Introduced by Drew McDermott and others in 1998, PDDL has “roughly the expressiveness of Pednault’s ADL for propositions and roughly the expressiveness of UMCP for actions”. The standardization of communication medium decreases frictions of exchange of ideas and leads to meaningful progress in the field.