Planning Historical Developments Research Review
Karolina Sala

In this review consists of a major planning and search developments and their influence in the artificial intelligence field. The report describes at least three key historical developments in the field of AI planning and the relationships between them. These three developments are the languages: the Stanford Research Institute Problem Solver, Action Description Language, and Planning Domain Definition Language.

One of the initial advances in AI planning was the STRIPS (Stanford Research Institute Problem Solver). STRIPS was developed by Richard Fikes and Nils NIllson in 1971 for automated planning. The STRIPS language became the basis for most automated planning languages (known as action languages) in use today. Is a part of the first major planning system. A STRIPS is composed from initial state, goals and a set of actions. The point was to find a series of operators in a space of models to alter an initial state into a model in which a given goal can be proven to be true. STRIPS was primarily used for robot research at SRI (Stanford Research Institute). [1] This language includes languages that occurred after STRIPS: both ADL (Pednault, 1986) and PDDL (Ghallab, 1998).

ADL (Action Description Language) was developed by Penault in 1986. The primary use was planning the actions and scheduling system of robots. This language extends the syntax of STRIPS action schemata, dropping some restrictions. ADL relaxed some of the STRIPS restrictions and made it possible to encode more realistic problems. [2] Examples of comparison between both languages are: the STRIPS language only allows positive literals in the states, while ADL can support both positive and negative literals, and the unmentioned literals are unknown, ADL, goals may involve conjunctions and disjunctions while in STRIPS the goals are only conjunctions. [3]

The PDDL was inspired by STRIPS and ADL. It was first developed by Drew McDermott and his colleagues in 1998. It was introduced as a computer-parsable, standardized syntax for representing planning problems and has been used as the standard language for the International Planning Competition since 1998. the most recent version, PDDL 3.0, includes plan constraints and preferences (Gerevini and Long, 2005). [2] It allows to define a goal, actions, conditions, and mutex, to enumerate over fluents to develop plans for reaching the goal. [4]

Bibliography:

[1] Richard E. Fikes, Nils J. Nilsson (Winter 1971). "STRIPS: A New Approach to the Application of Theorem Proving to Problem Solving". *Artificial Intelligence*. 2 (3–4): 189–208 Available at: http://ai.stanford.edu/~nilsson/OnlinePubs-Nils/PublishedPapers/strips.pdf

[2] Stuart J. Russell, Peter Norvig (2010), *Artificial Intelligence: A Modern Approach (3rd Edition)* Available at: https://dcs.abu.edu.ng/staff/abdulrahim-abdulrazaq/courses/cosc208/Artificial%20Intelligence%20A%20Modern%20Approach%20(3rd%20Edition).pdf

[3] *Action description language*: https://en.wikipedia.org/wiki/Action_description_language

[4] *Planning Domain Definition Language* https://en.wikipedia.org/wiki/Planning_Domain_Definition_Language