Fuzzy logic

Fuzzy logic is a form of many-valued logic in which the truth values of variables may be any real number between 0 and 1. By contrast, in Boolean logic, the truth values of variables may only be the integer values 0 or 1. *(Novák, 1999)*

The inventor of fuzzy logic, Lotfi Zadeh, observed that unlike computers, the human decision making includes a range of possibilities between YES and NO, such as −CERTAINLY YES, POSSIBLY YES, CANNOT SAY, POSSIBLY NO, CERTAINLY NO. *(Artificial Intelligence - Fuzzy Logic Systems, 2017)* A similar kind of process is used in *neural networks, expert systems and other artificial intelligence* applications. *(Rouse, 2016)*

Areas where fuzzy logic and artificial intelligence meet in research in planning and search was *robotics* (involving motion control and planning capabilities, e.g. when flying a fully automated helicopter or driving a car on a freeway) *(Erich Peter Klement, 1997)*

Applications of Fuzzy logic in planning are PERT planning with uncertain activity durations, Multi-Criteria Decision Analysis (MCDA) with vague preferential statements, and Multi-Objective Optimization (MOO) with weighted degrees of satisfaction. *(Lootsma, 2013)*

Dijkstra's algorithm

Dijkstra's algorithm is an algorithm for finding the shortest paths between nodes in a graph, which may represent, for example, road networks. It was conceived by computer scientist Edsger W. Dijkstra in 1956. *(Frana, 2010)* Dijkstra's algorithm or a variant of it is known as *uniform-cost search* and formulated as an instance of the more general idea of *best-first search*. *(Felner, 2011)*

The *A* algorithm* is a generalization of Dijkstra's algorithm that cuts down on the size of the sub graph that must be explored; if additional information is available that provides a lower bound on the "distance" to the target. Breadth-first search can be viewed as a special-case of Dijkstra's algorithm on unweighted graphs, where the priority queue degenerates into a FIFO queue. *(Dijkstra's algorithm, 2017)*

STRIPS

STRIPS (Stanford Research Institute Problem Solver) is an automated planner developed by Richard Fikes and Nils Nilsson in 1971 at SRI International. *(Richard E. Fikes, 1971)* The same name was later used to refer to the formal language of the inputs to this planner. This language is the base for most of the languages for expressing automated planning problem instances in use today.

STRIPS was an inspiration for Drew McDermott and his colleagues in 1998 to develop Planning Domain Definition Language (**PDDL**), a standardized Artificial Intelligence planning language *(Planning Domain Definition Language, 2016)* which is a common language for writing STRIPS domain and problem. *(BECKER, 2015)*

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