

Summary

Logic is the science of normative formal principles of reasoning, in similar sense fuzzy logic is concerned with the formal principles of approximate reasoning, with precise reasoning viewed as a limited case. Unlike classic Logical systems Fuzzy Logic provides a system for representing propositions that are used in Natural Language. Fuzzy logic is applicable in different fields from finance to earthquake engineering, various universities and laboratories around the globe have researched and applied fuzzy logic on different projects like Steam Engine, speech recognition, automatic train engine etc. Dispositional logic deals with the propositions that may not always be true. Fuzzy logic has great power to express as a fact that it contains special cases unlike the two valued logic. Fuzzy logic deals with approximate models rather than precise models which were typically used in the classical Logic Systems. In Fuzzy Logic, everything including the truth is a matter of degree.

Fuzzy Logic has three principles of qualifications :-

1. Truth-Qualification
2. Probability-Qualification
3. Possibility-Qualification

An Important issue in Fuzzy logic is that it relates to the inference drawn by the qualified propositions which may arise as an issue in an expert system. Fuzzy Syllogism in fuzzy logic that is of considerable relevance in the rules of combinations in an expert system is the intersection-syllogism/product-syllogism which may serve as inference for quantified propositions. Interpolation is often An important problem that arises in the operation of any rule-based system is the following. Suppose the user supplies a fact that, in its canonical form, may be expressed as "X is A," where A is a fuzzy or non fuzzy predicate. Furthermore, suppose that there is no conditional rule in K6 whose antecedent matches A exactly. The question arises: Which rules should be executed and how should their results be combined?

Usually the approach to solve this problem involves the use of an interpolation technique in fuzzy logic which requires a computation of the degree of partial match between the user-supplied fact and the rows of a decision table. A basic concept in fuzzy logic that plays a key role in many of its applications, especially in the realm of fuzzy control and fuzzy expert systems, is a linguistic variable.

A linguistic variable, as its name suggests, is a variable whose values are words or sentences in a natural or synthetic language. An application of linguistic variables is involved in the idea behind the Sugeno fuzzy car, where the distance from the boundaries of the track are measured and mapped with linguistic variables and are represented using the triangular possibility distribution.

Several expert system shells based on fuzzy logic are now commercially available, among them Reveal and Flops. The development of fuzzy logic chips paved the way for using the fuzzy chip sets in fuzzy logic systems which does not require higher precisions. Several other advancements in development of hi-tech fuzzy chips were brought about by Togai and Watnabe. Yamkawa brought its fuzzy computer whose hardware was built by OMRON Tateise Electronics Corporation is capable of performing its function at an extremely high speed. This advancement in the field of fuzzy hardware may be an important step toward a sixth-generation computer capable of processing common sense knowledge. This capability of the systems to have a common sense and general understanding of things is the base of many AI based problems like e, handwritten text recognition, speech recognition, machine translation, summarization, and image understanding - that do not lend themselves to cost-effective solution within the bounds of conventional technology.