

INTRODUCTION TO FUZZY LOGIC

Motivation

- The term “fuzzy logic” refers to a logic of approximation.
- Boolean logic assumes that every fact is either entirely true or false.
- Fuzzy logic allows for varying degrees of truth.
- Computers can apply this logic to represent vague and imprecise ideas, such as “hot”, “tall” or “balding”.

What is meant by fuzzy?

Fuzzy (technical meaning) is

- imprecise, uncertain or unreliable knowledge,
- uncertain/noisy/incomplete Information,
- ambiguity (vague)
- or partial truth

Difference between imprecision and uncertainty

Consider the following two situations :

1. John has at least two children and I am sure about it.
2. John has three children but I am not sure about it.

In case 1, the number of children is imprecise but certain.

In case 2, the number of children is precise but uncertain.

Uncertainty

- There is uncertainty that arises from ignorance, from various classes of randomness, from the inability to perform adequate measurements, from lack of knowledge, or from vagueness.

Types of Uncertainty

1. **Stochastic uncertainty**: It is the uncertainty towards the occurrence of a certain event.
2. **Lexical uncertainty**: It is the uncertainty lies in human languages like hot days, stable occurrence, a successful financial year and so on.

Ambiguity (vague)

- Food is hot.
- Here hot may be 'spicy' or 'warm'

Partial truth

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World of information

