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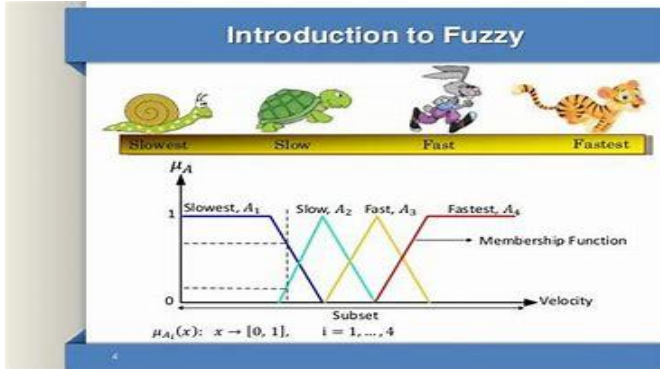**Approved by AICTE, New Delhi & Affiliated to Anna University, Chennai**

ARTIFICIAL INTELLIGENCE FOR ELECTRICAL ENGINEERING

TOPIC: **INTRODUCTION TO FUZZY SETS**

TOPIC OUTLINE

What is fuzzy logic system in AI ?

Architecture of fuzzy sets

Why fuzzy is important in AI?
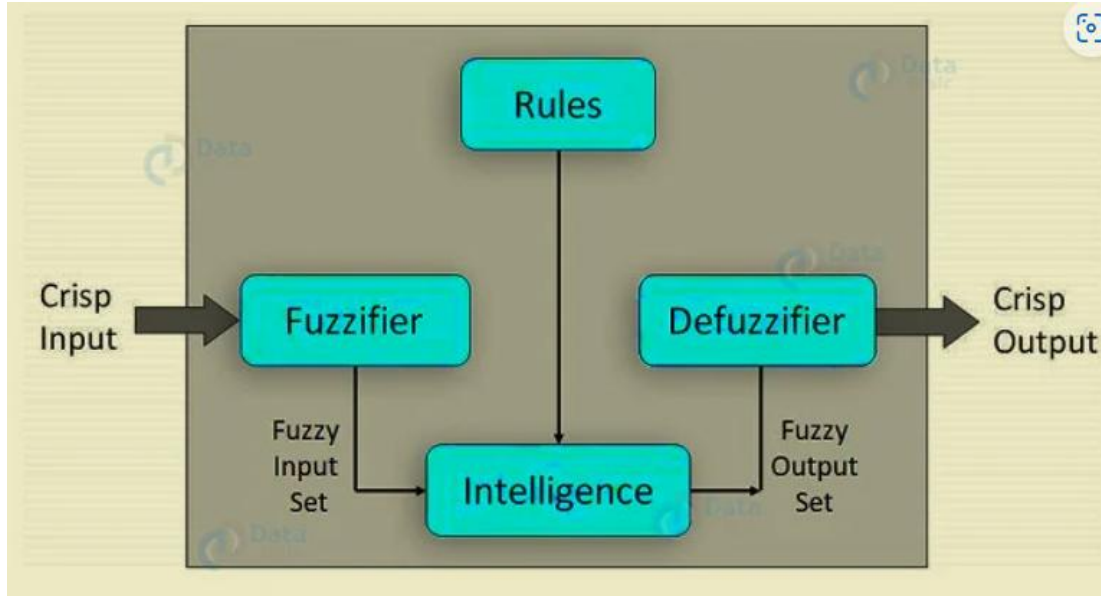
Advantage & Disadvantage of fuzzy sets in AI?

What is fuzzy logic system in AI?

•Generally, it's a method of reasoning. Although, resembles human reasoning. Also, it has an approach to decision making in humans. As they involve all intermediate possibilities between digital values YES and NO.

•Fuzzy Logic System was invented by Lotfi Zadeh. Also, he observed, unlike other computers, it includes a range of possibilities between YES and NO, in a human decision.

•We can use it to consumer products and control machines.

•Although, not give accurate reasoning, but acceptable reasoning.

•Also, this logic helps to deal with the uncertainty in engineering.

Architecture Of Fuzzy Sets

Basically, four parts are shown in the architecture of fuzzy logic system;

A. **Fuzzification Module**

We use this module to transform the system inputs. As tha is is crisp number.

Also, helps in splitting the input signal into various five steps.

LP – x is Large Positive.

MP- x is Medium Positive.

S – x is Small.

MN – x is Medium Negative.

LN – x is Large Negative

B. **Knowledge Base**

In this, we have to store it in IF-THEN rules that was provided by experts.

C. Inference Engine

Generally, it helps in simulating the human reasoning process. That is by making fuzzy inference on the inputs and IF-THEN rules.

D. **Defuzzification Module**

In this module, we have to transform fuzzy set into a crisp value. That set was obtained by an inference engine.

Fuzzy Logic Applications

A. Automotive Systems
  1. Automatic Gearboxes
  2. Four-Wheel Steering
  3. Vehicle environment control

B. Consumer Electronic Goods
  1. Hi-Fi Systems
  2. photocopiers
  3. Still and Video Cameras
  4. Television

C. Domestic Goods
  1. Microwave Ovens
  2. Refrigerators
  3. Toasters
  4. Vacuum Cleaners
  5. Washing Machines

D. Environment Control
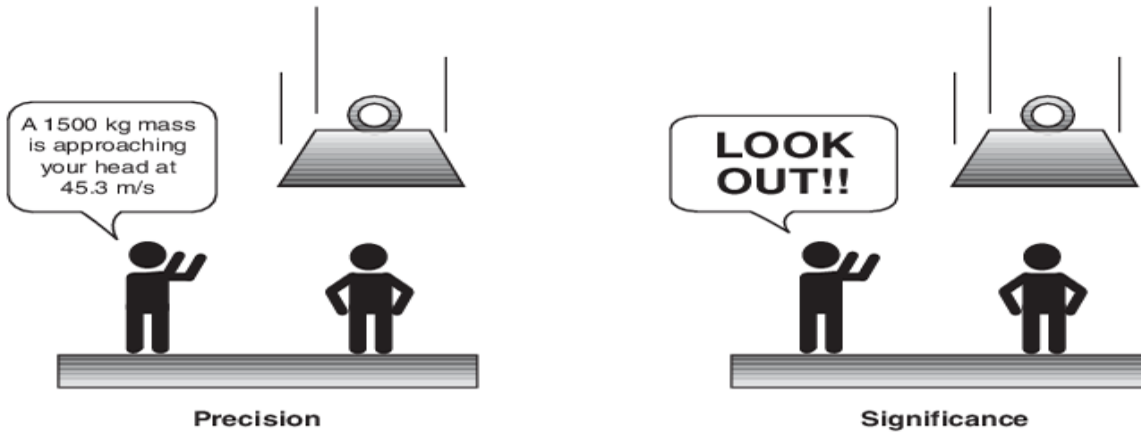 1. Air Conditioners/Dryers/Heaters
  2. Humidifiers

Fuzzy Logic in Real world

Precision and Significance in the Real World

A 1500 kg mass is approaching your head at 45.3 m/s

LOOK OUT!!

Precision

Significance

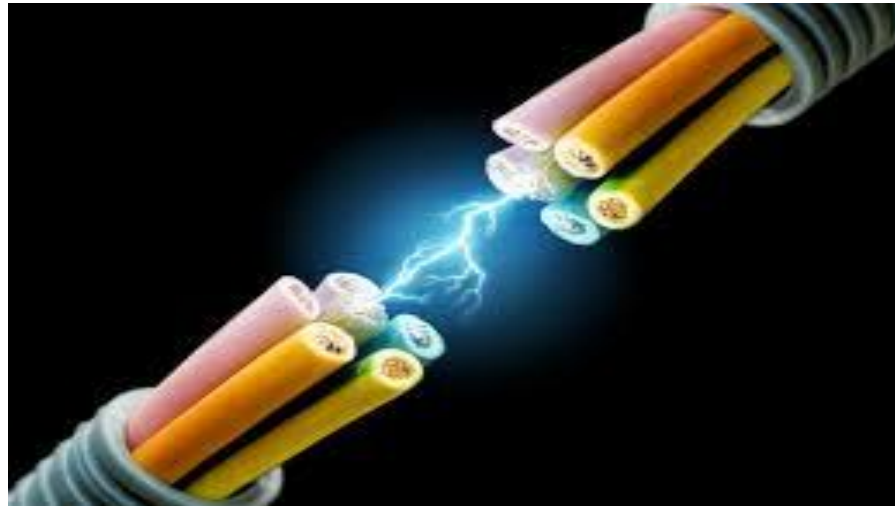**Advantages of Fuzzy Logic Systems**

- Generally, in this system, we can take imprecise, distorted, noisy input information.
- Also, these logics are easy to construct and understand.
- Basically, it's solution to complex problems. Such as medicine.
- Also, we can relate math in concept within fuzzy logic. Also, these concepts are very simple.
- Due to the flexibility of fuzzy logic, we can add and delete rules in FLS system.

Disadvantages of Fuzzy Logic Systems

- Till no designing approach to this fuzzy logic.
- Basically, if logics are simple, then one can understand it.
- Also, suitable for problems which do not have high accuracy.
- So, this was all about Fuzzy Logic systems in AI. Hope you like our explanation

RECAP....

...THANK YOU