

## FUZZY LOGIC SUMMARY

Fuzzy logic is to make rational decisions in an environment of uncertainty & imprecision.

Two issues in classical logic system:

- ❑ Meaning is imprecise
- ❑ Meaning can represent symbolically

Advantage: More flexible, elastic constant

Initially the cost of fuzzy logic implementation was cheap so it was a boom in the market.

Fuzzy logic follows the rule of common sense. In fuzzy logic everything including truth is a matter of degree. It is different from traditional system like In traditional system we have either true or false whereas in fuzzy system we have true, false most likely true, intermediate etc.

It can be represented in canonical form as  $P \rightarrow x \text{ is } A$  where  $x$  is characteristic/ variable and  $A$  is value.

Inference with fuzzy probabilities

reduction to a nonlinear program may be applied is the following. Assume that from a knowledge base  $KB = \{p_1, \dots, p_N\}$ .

Where  $q$ :proposition.

The conclusion,  $q$  can also be expressed as  $q' = q \text{ is } \lambda$

Lambda is a fuzzy probability.

- ❑ Fuzzy probabilities  $\lambda_i$  are close unity.
- ❑ It is robust if whenever the  $\lambda_i$  are close to unity.

In general, the inference process is not compositional if the  $\lambda_i$  and  $\lambda$  are numerical probabilities.

In expert systems in which the certainty factor of the conclusion is expressed as a function of the certainty factors of the premises.

Also we get an important conclusion relating to the robustness of the inference process is that, in general, robustness does not hold without some restrictive assumptions on the premises. basic concept of fuzzy logic that plays a key role in many of its application in the realm of fuzzy control and fuzzy expert system is a linguistic variable.

Interpolation

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 " $X \text{ is } A$ ," where  $A$  is a fuzzy or non-fuzzy predicate.

An approach which requires a computation of the degree of partial match between the user-supplied fact and the rows of a decision table.

More specifically, suppose that upon translation into their canonical forms, a group of propositions in  $K_6$  may be expressed as a fuzzy relation.