

Using Fuzzy Systems to predict student test scores

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Overview

- Basic notions
- Student pole
- Results and analysis

Fuzzy sets

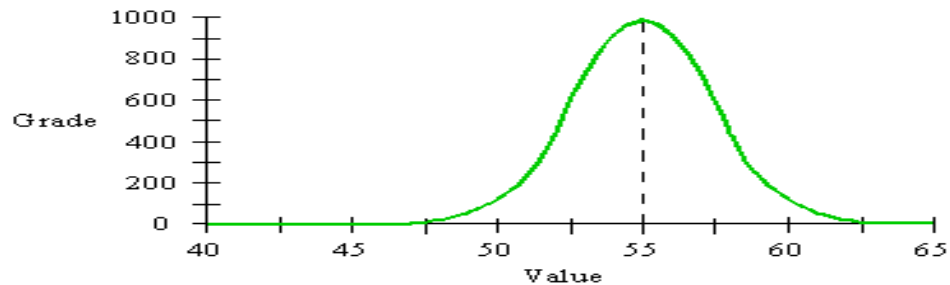
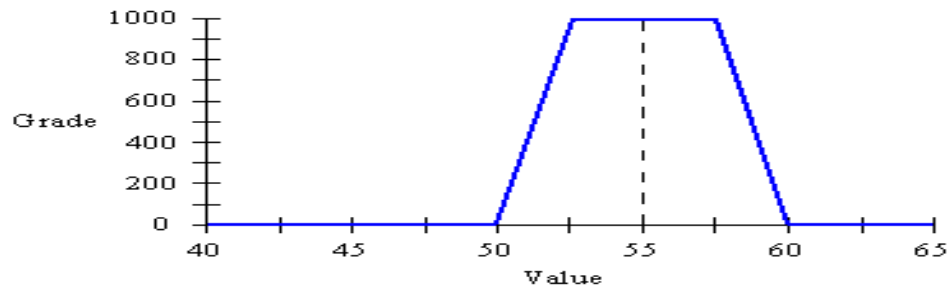
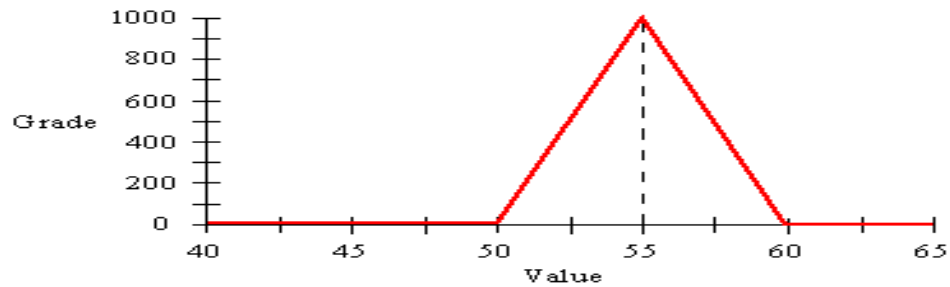
- Classical – crisp set

$$\mu_A(x) = \begin{cases} 1, & x \in A \\ 0, & x \notin A \end{cases}$$

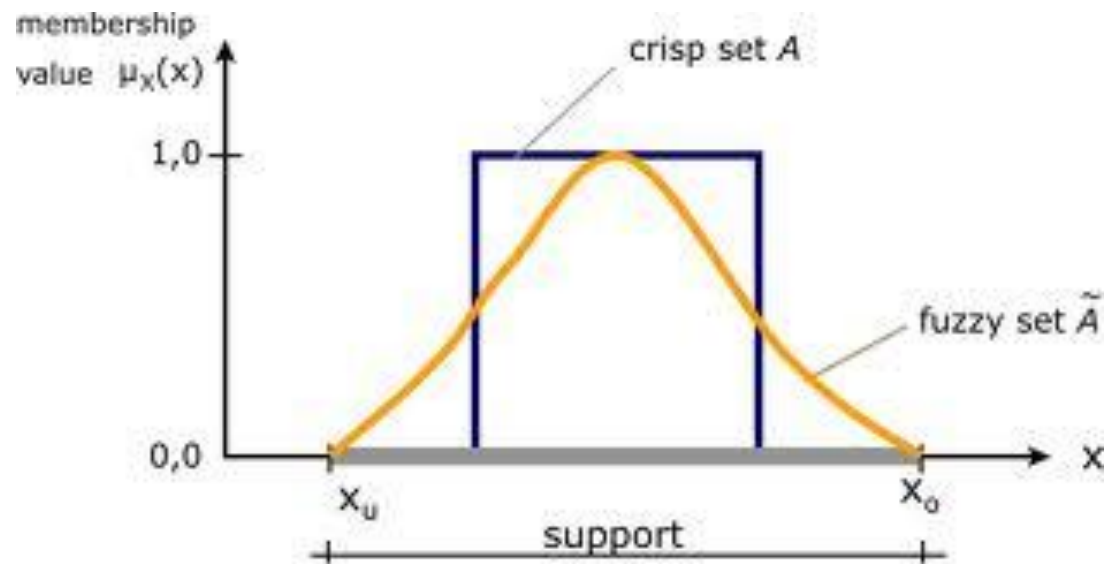
- Fuzzy set

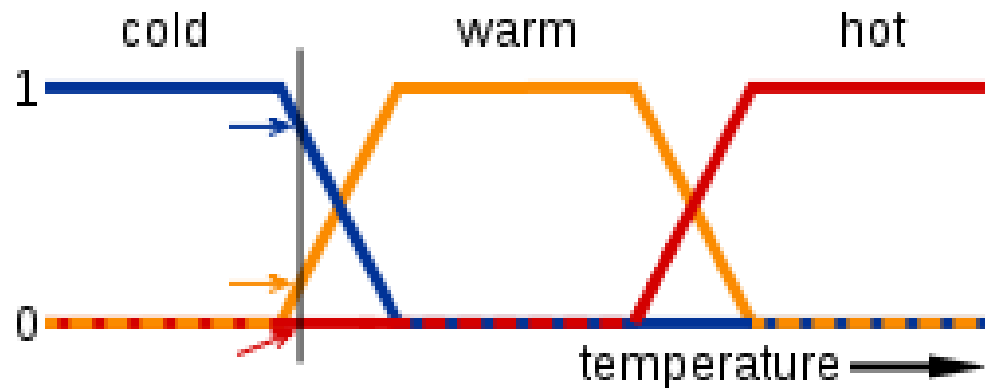
$$\mu_A(x) \in [0,1]$$

Most common fuzzy sets

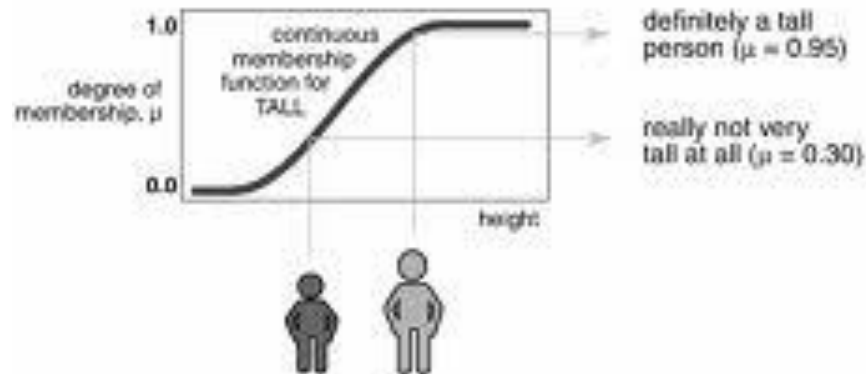
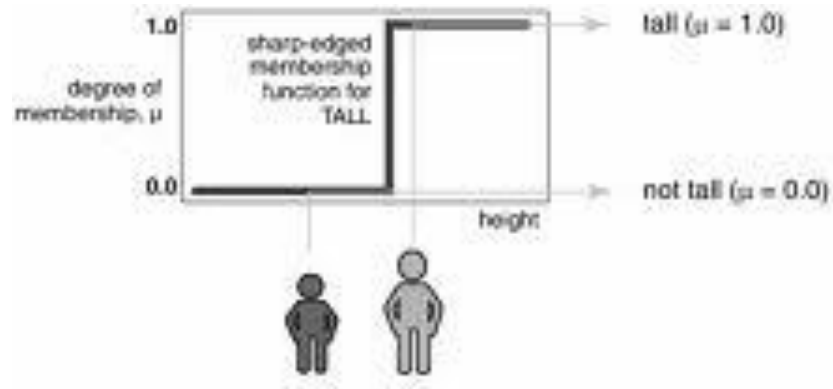


Membership functions

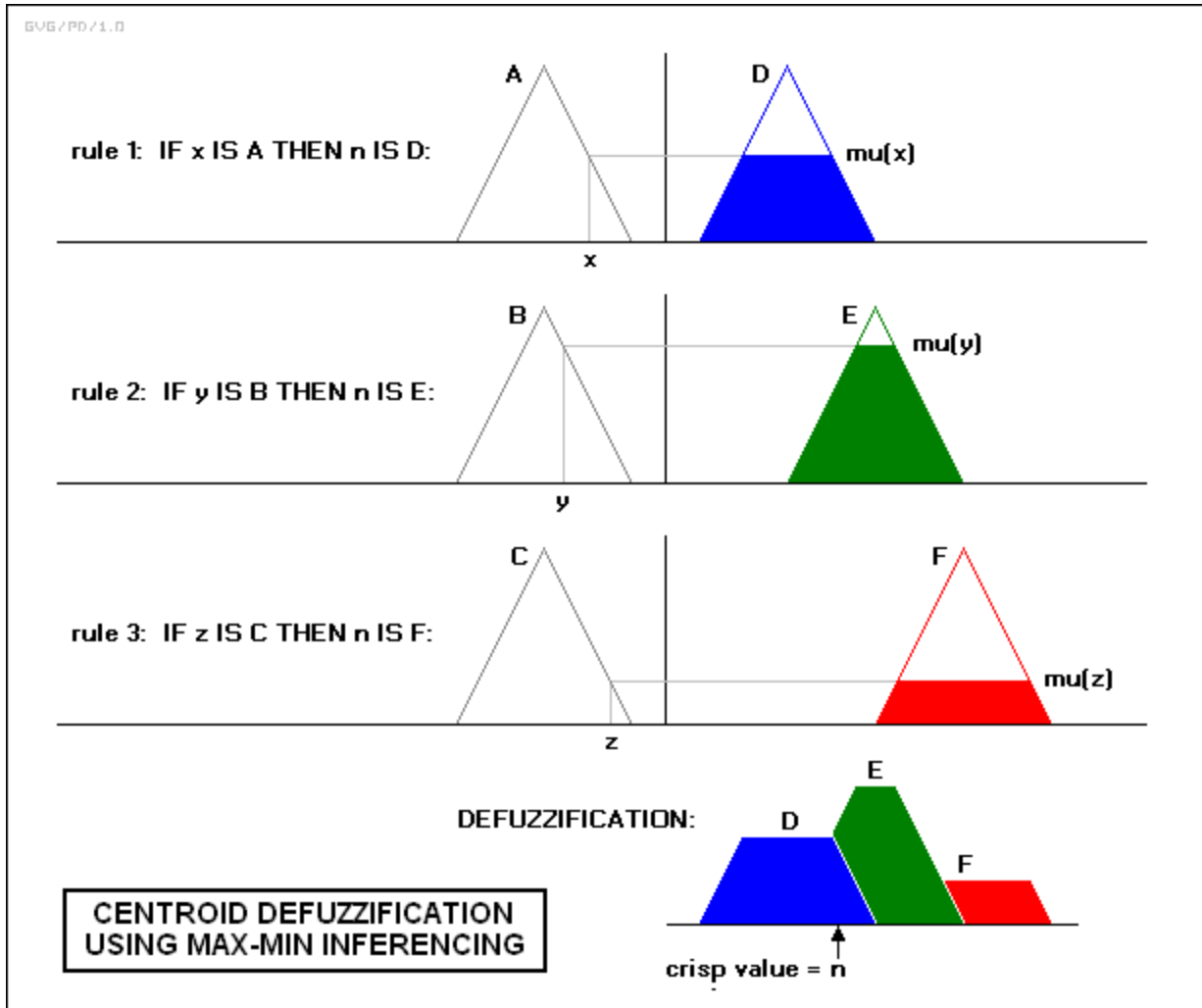




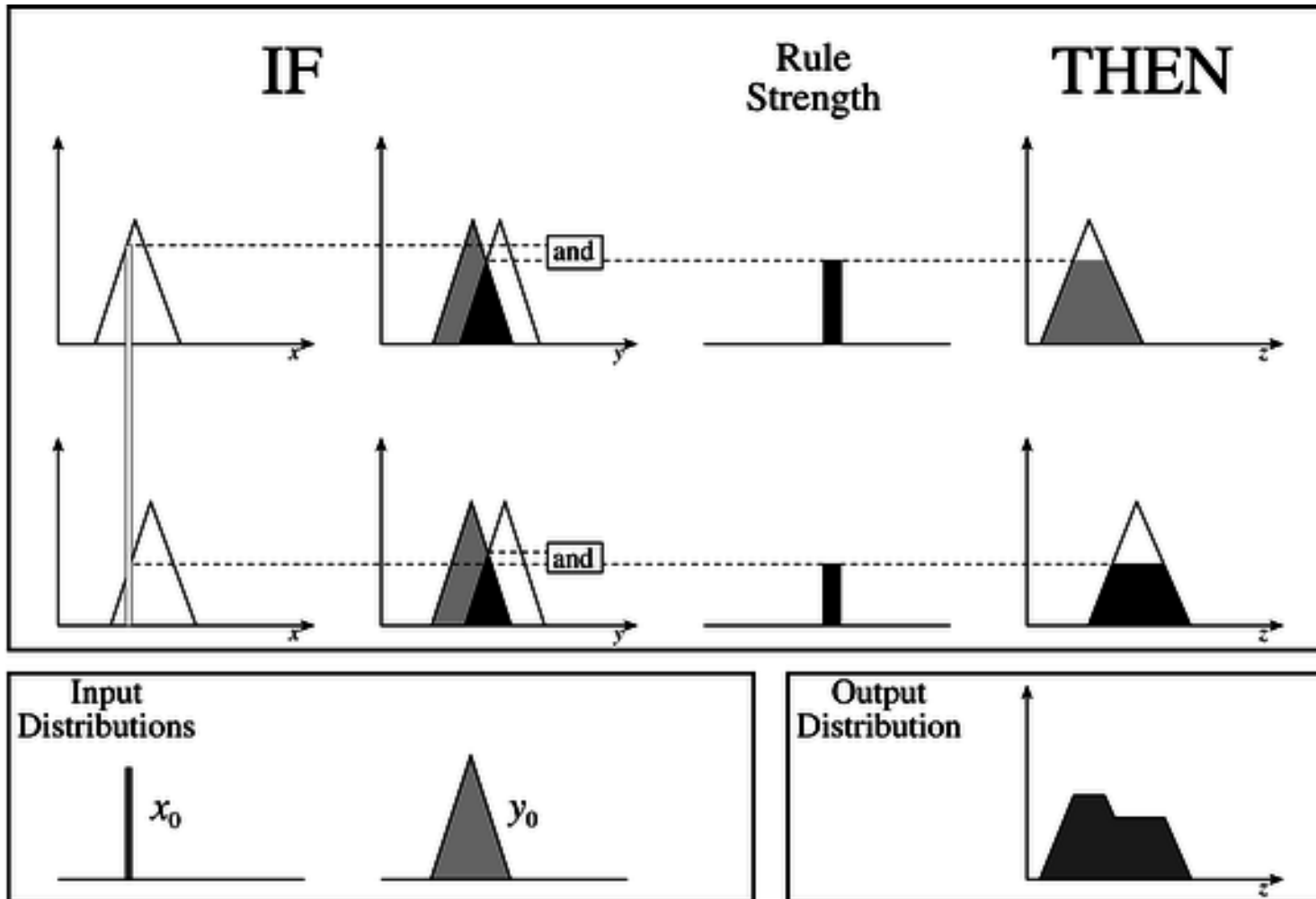
Membership function example



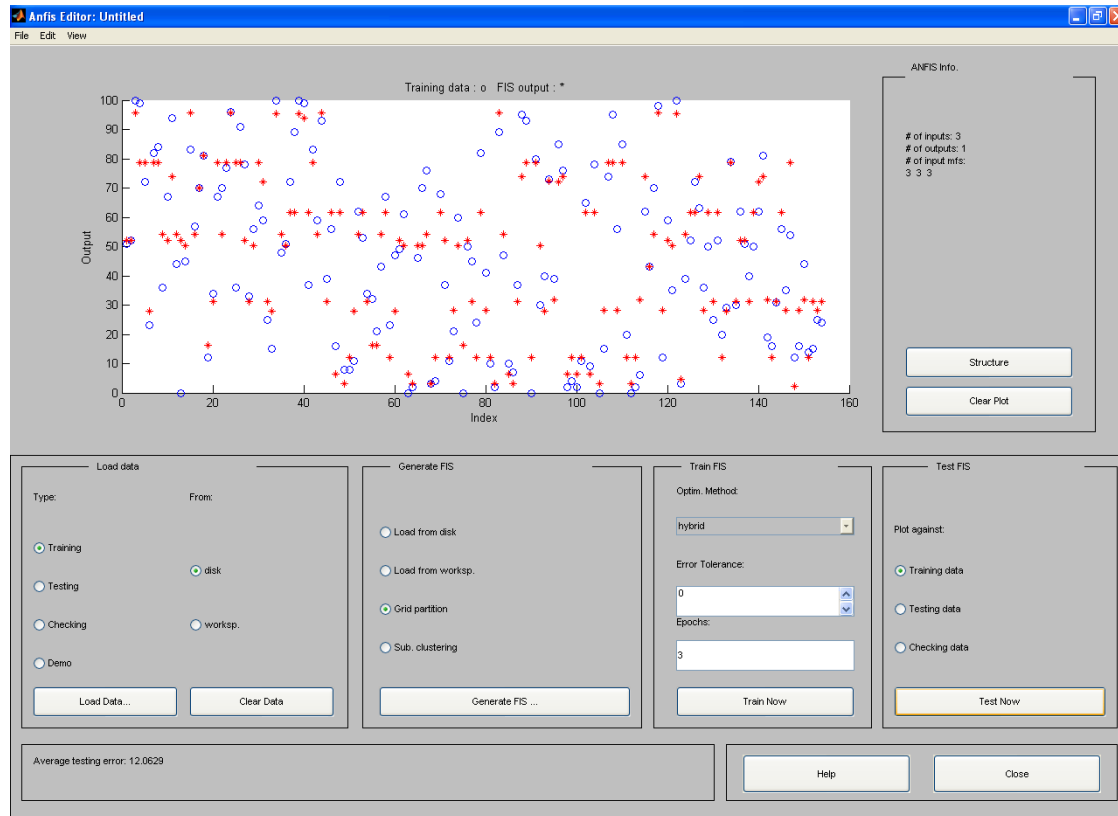
Fuzzy control



Fuzzy control(in black&white)



Matlab 7.0 Fuzzy Toolbox



Pole data

- Students were asked to give a degree of their
 - computer skills (1-5)
 - desire to learn GeoGebra(1-3)
 - attitude towards math(1-5)

This data was used to predict the student test score and the results of testing was compared to the genuine test result

More pole data

- 308 students were examined
- 154 were used to train the fuzzy system
- 77 were to test
- 77 were used to check

Fuzzy system

3 inputs

- computer skills (1-5)
- desire to learn GeoGebra(1-3)
- attitude towards math(1-5)

1 output

TEST SCORE

Prediction errors

***avg* 9.15**

***max* 29.02**

***median* 5.41**

Thank you for your attention!!!!

