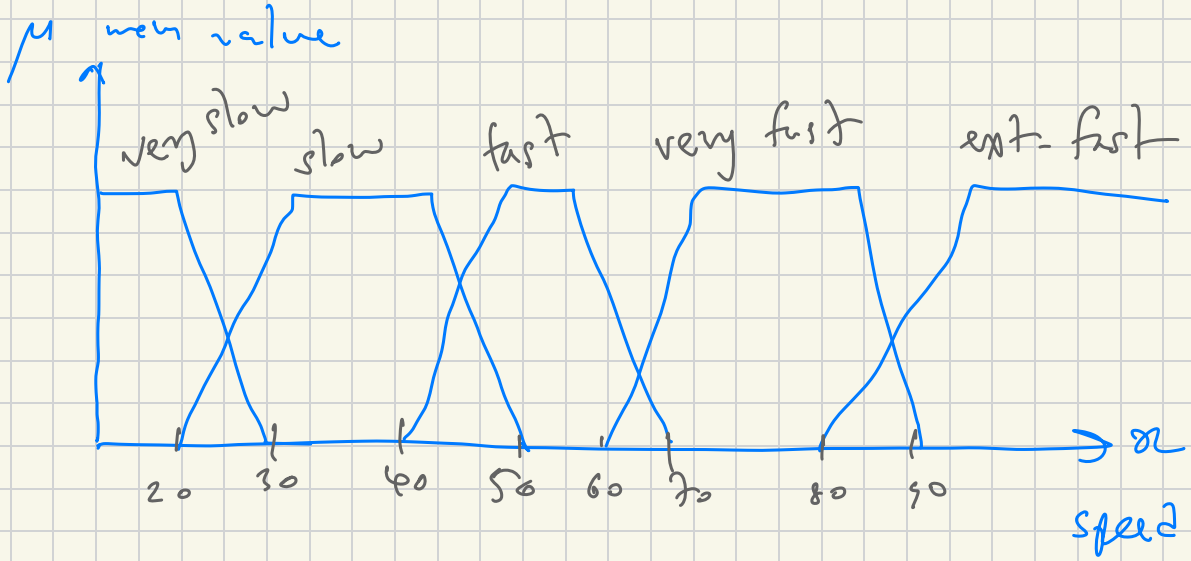
[10] fuzzification

- intuition
- inference
- Rank ordering
- Genetic algo
- inductive reasoning
- Neural Network

Intiution

mem- fr from own understanding & knowledge, experience



thes curves & x values vary dep on the context

Inference

assign membership values based on deductive reasoning using knowledge

Ex mem fn to different types of triangles

U : universe of triangles

A, B, C inner angles of triangles

$$A \geq B \geq C \geq 0$$

$$U = \{ (A, B, C) \mid A + B + C = 180^\circ,\ A \geq B \geq C \geq 0 \}$$

types we need to find

I - approx. isosceles triangle

E - approx. Equilateral triangle

R - approx. Right triangle

IR - approx. isoceles & Right trgle

T - other Triangles

not maths, just base on our experience only

for I,

$$\mu_I(A,B,C) = 1 - \frac{\min(A-B,\ B-C)}{60^\circ}$$

A, B, C ∈ isosceles Δ when $\mu = 1$

for E

$$\mu_E(A,B,C) = 1 - \frac{(A-C)}{180^\circ}$$

for R

$$\mu_R(A,B,C) = 1 - \frac{|A-90^\circ|}{90^\circ}$$

for IR

$$IR = I \cap R$$

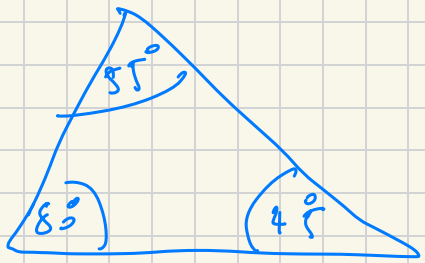
$$\therefore \mu_{IR}(A,B,C) = \min\left[\mu_I(A,B,C),\ \mu_R(A,B,C)\right]$$

for T

$$T = \overline{(I \cap R \cap E)}$$

$$\mu_T(A,B,C) = 1 - \max\left[\mu_I(A,B,C),\ \mu_R(A,B,C),\ \mu_E(A,B,C)\right]$$

now Example



$A \geq B \geq C \geq 0$

$\therefore \quad A = 80^\circ$

$B = 55^\circ$

$C = 45^\circ$

Plug A, B, C values for each above types

$\mu_I(A, B, C) = 0.833$ ← but also like a isoceles Δ

$\mu_E(A, B, C) = 0.805$

$\mu_R(A, B, C) = 0.888$ ← given triangle is more like a right angle //

$\mu_{IR}(A, B, C) = 0.833$

$\mu_T(A, B, C) = 0.112$