

## Fuzzy Logic Example

### Automotive Speed Controller

3 inputs:

speed (5 levels)

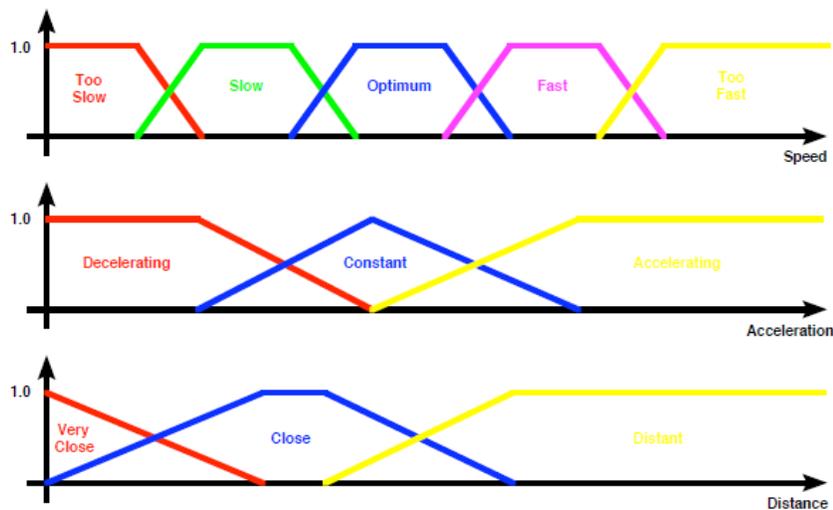
acceleration (3 levels)

distance to destination (3 levels)

1 output:

power (fuel flow to engine)

Set of rules to determine output based on input values



### Example Rules

IF speed is TOO SLOW and acceleration is DECELERATING, THEN INCREASE POWER GREATLY

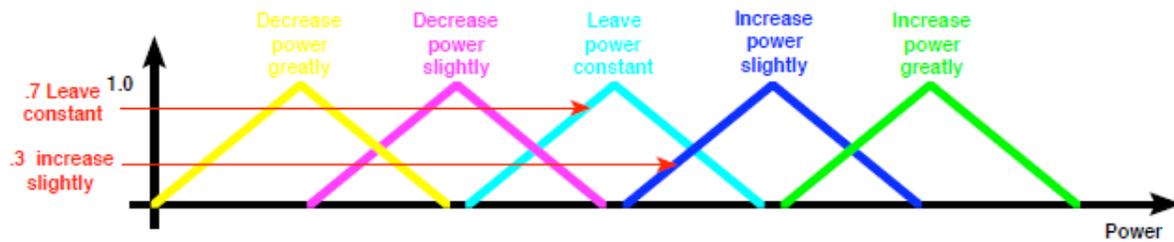
IF speed is SLOW and acceleration is DECREASING, THEN INCREASE POWER SLIGHTLY

IF distance is CLOSE, THEN DECREASE POWER SLIGHTLY

## Output Determination

Degree of membership in an output fuzzy set now represents each fuzzy action.

Fuzzy actions are combined to form a system output.



## Steps

Fuzzification: determines an input's % membership in overlapping sets.

Rules: determine outputs based on inputs and rules.

Combination/Defuzzification: combine all fuzzy actions into a single fuzzy action and transform the single fuzzy action into a crisp, executable system output. May use centroid of weighted sets.