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Fuzzy Logic

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WHAT IS FUZZY LOGIC?

- **Definition of fuzzy**

- Fuzzy – “not clear, distinct, or precise; blurred”

- **Definition of fuzzy logic**

- A form of knowledge representation suitable for notions that cannot be defined precisely, but which depend upon their contexts.

TRADITIONAL REPRESENTATION OF LOGIC



Slow

Speed = 0



Fast

Speed = 1

```
bool speed;  
get the speed  
if ( speed == 0 ) {  
    // speed is slow  
}  
else {  
    // speed is fast  
}
```

FUZZY LOGIC REPRESENTATION

- For every problem must represent in terms of fuzzy sets.
- What are fuzzy sets?



Slowest
[1, 0]



Slow
[0.8, 0.2]



Fast
[0.4, 0.6]

Fastest
[0.6, 0.4]



FUZZY LOGIC REPRESENTATION

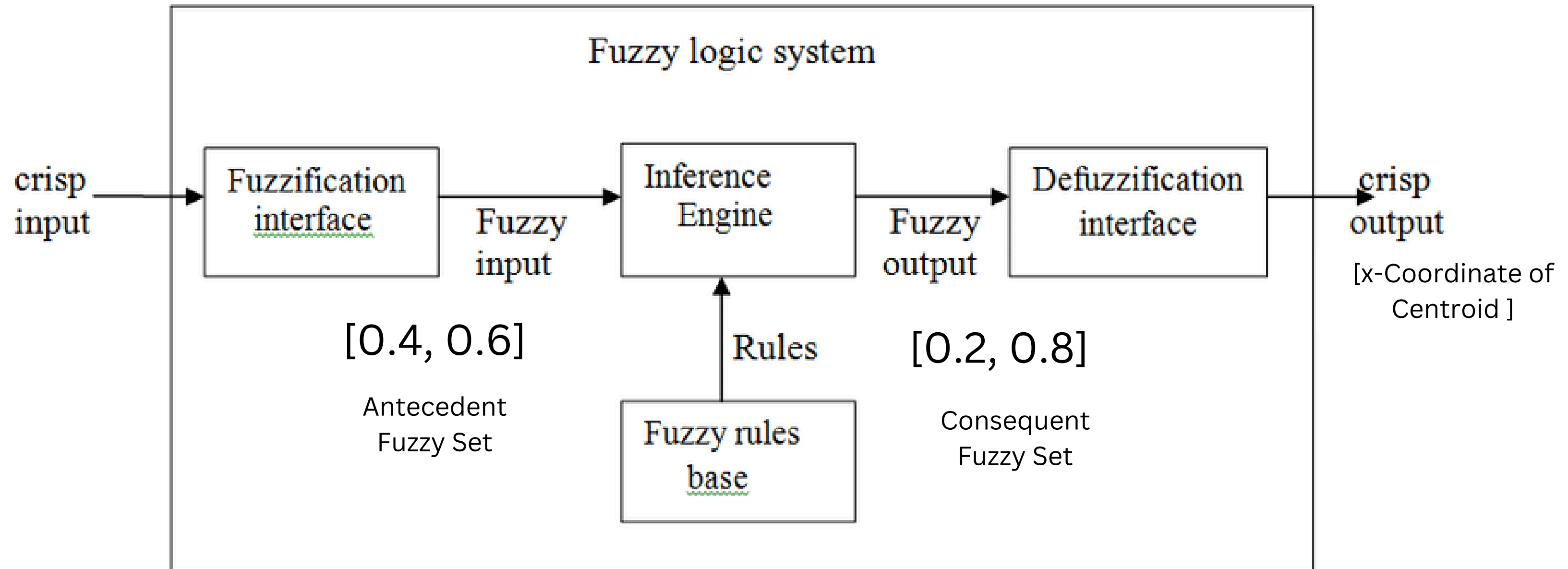


Slowest

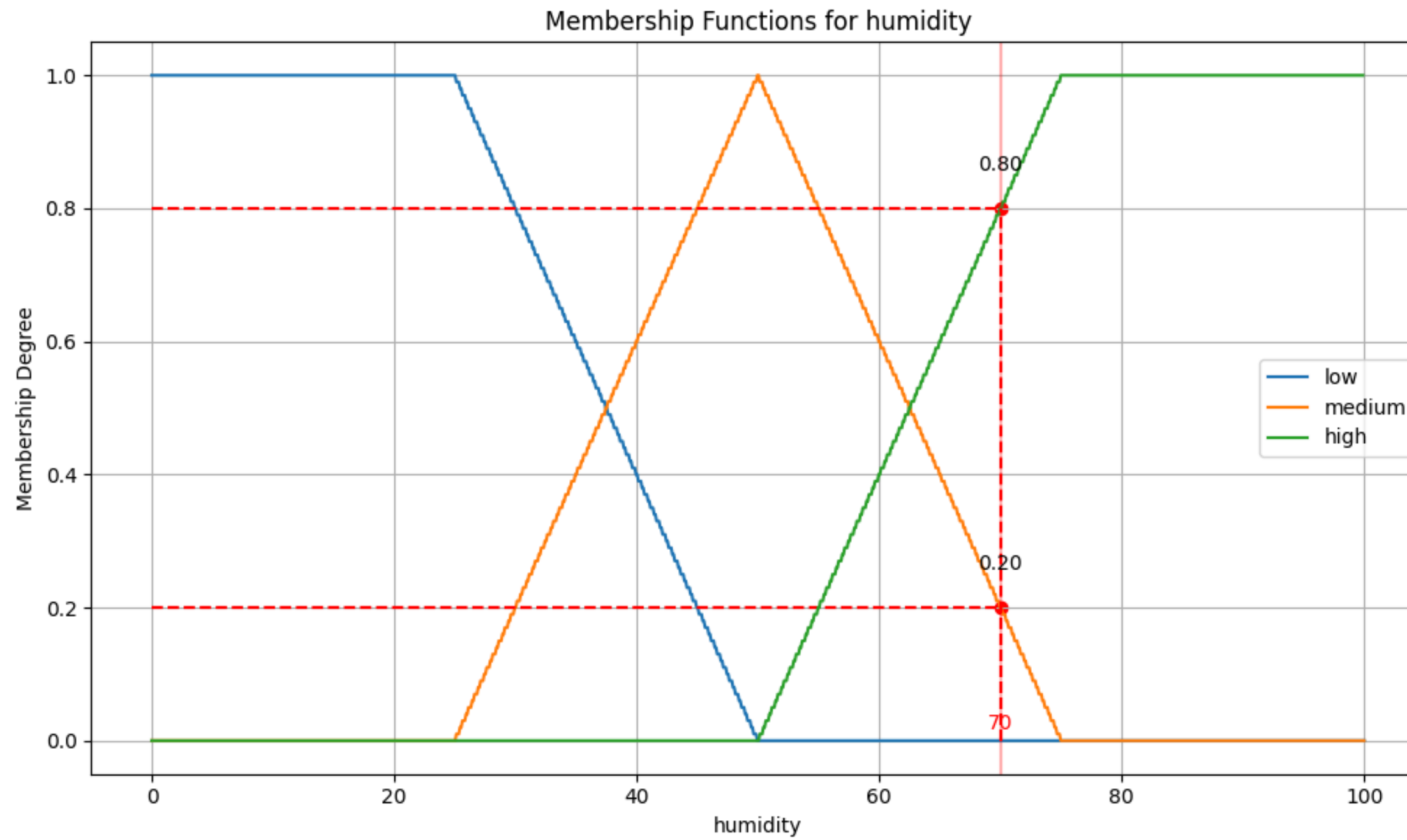
Slow

Fast

FUZZY LOGIC SYSTEM

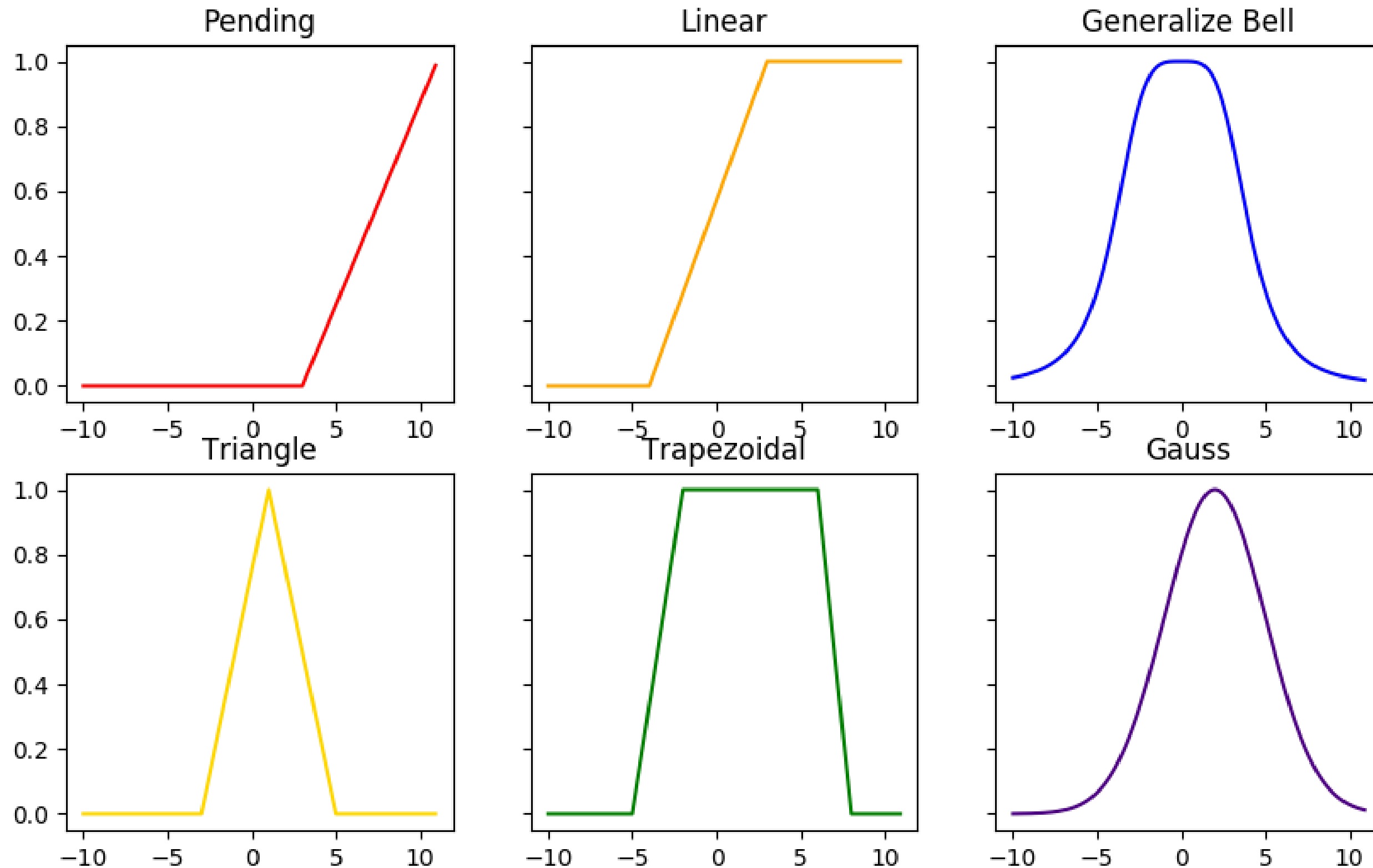


Fuzzification

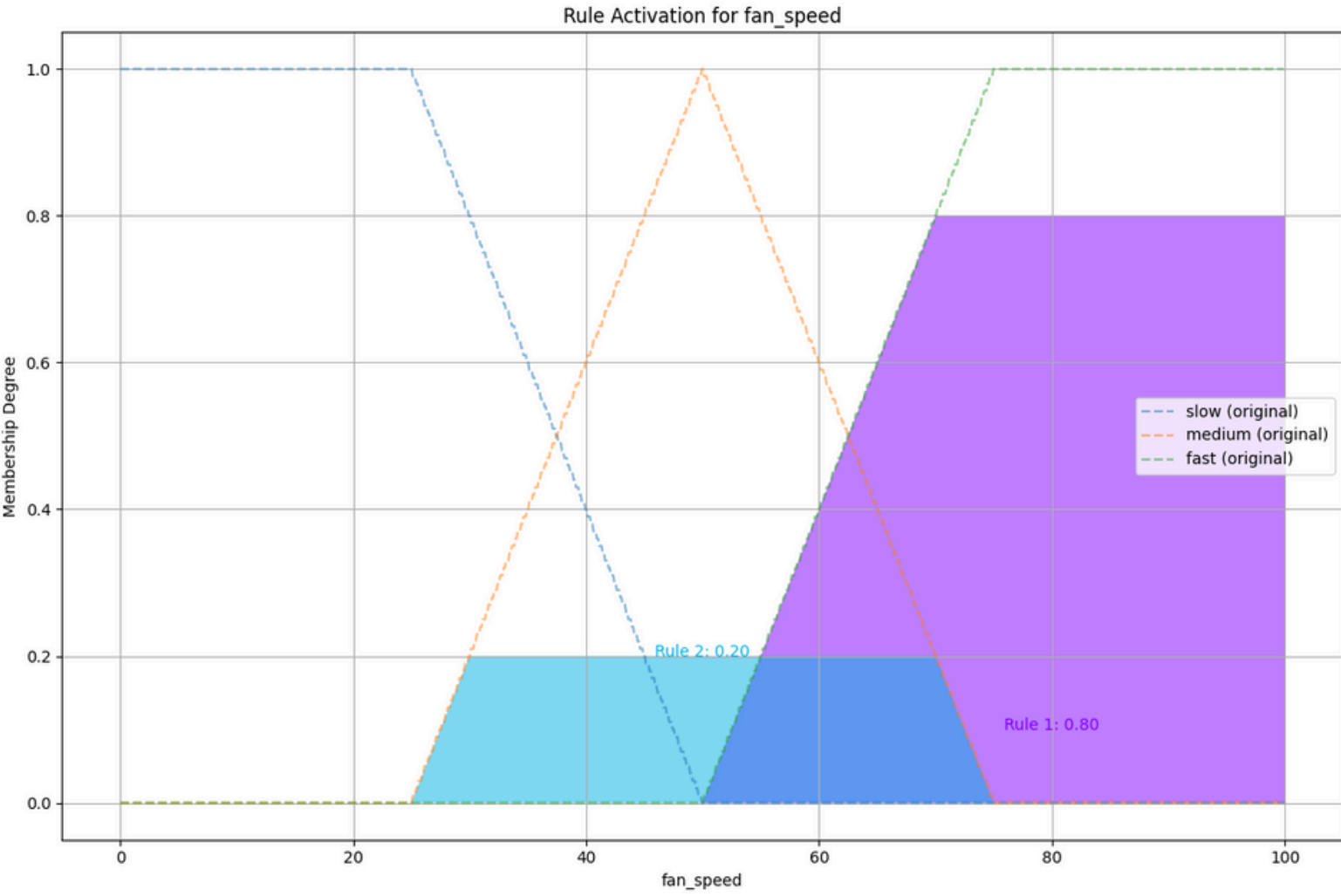
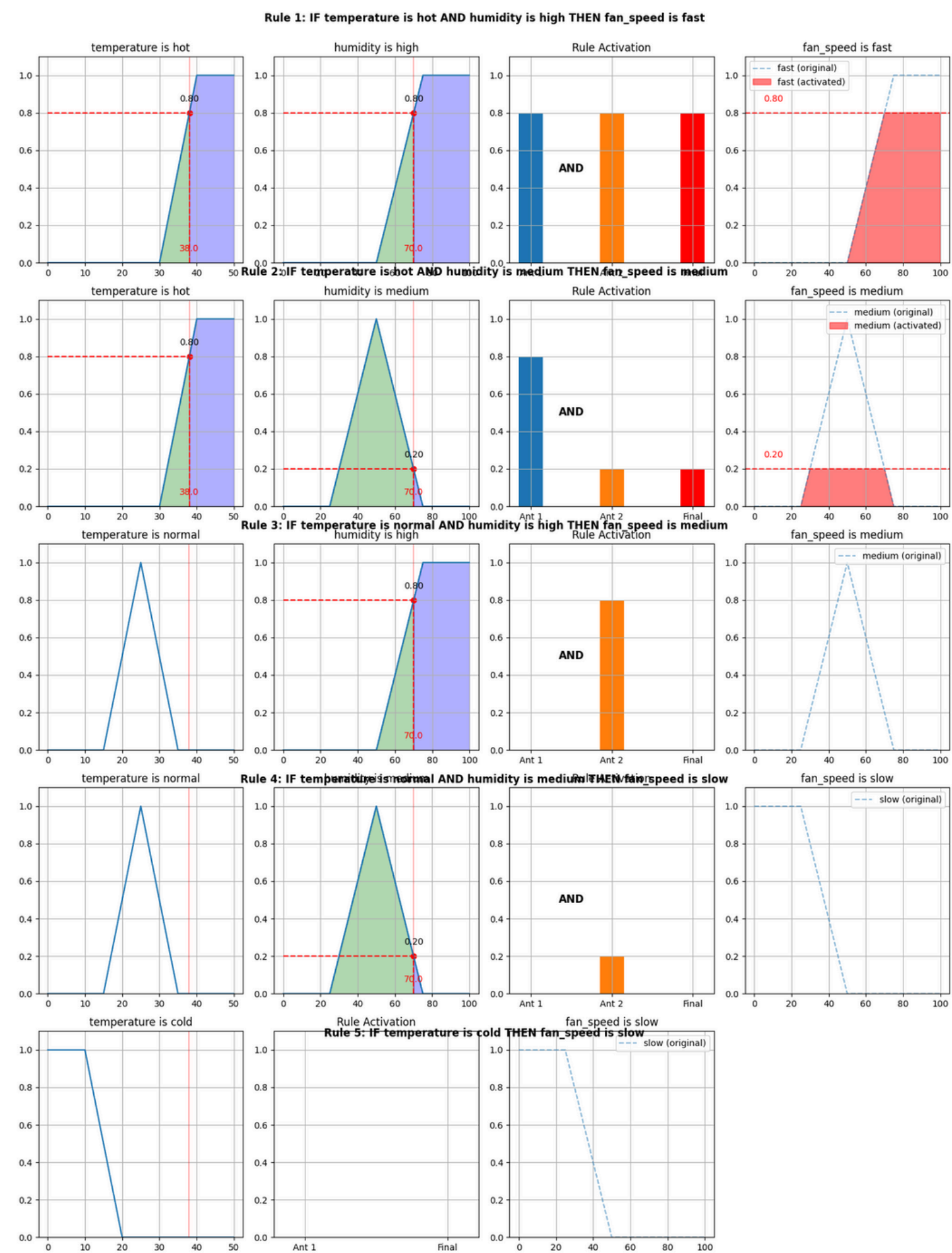


Membership Function

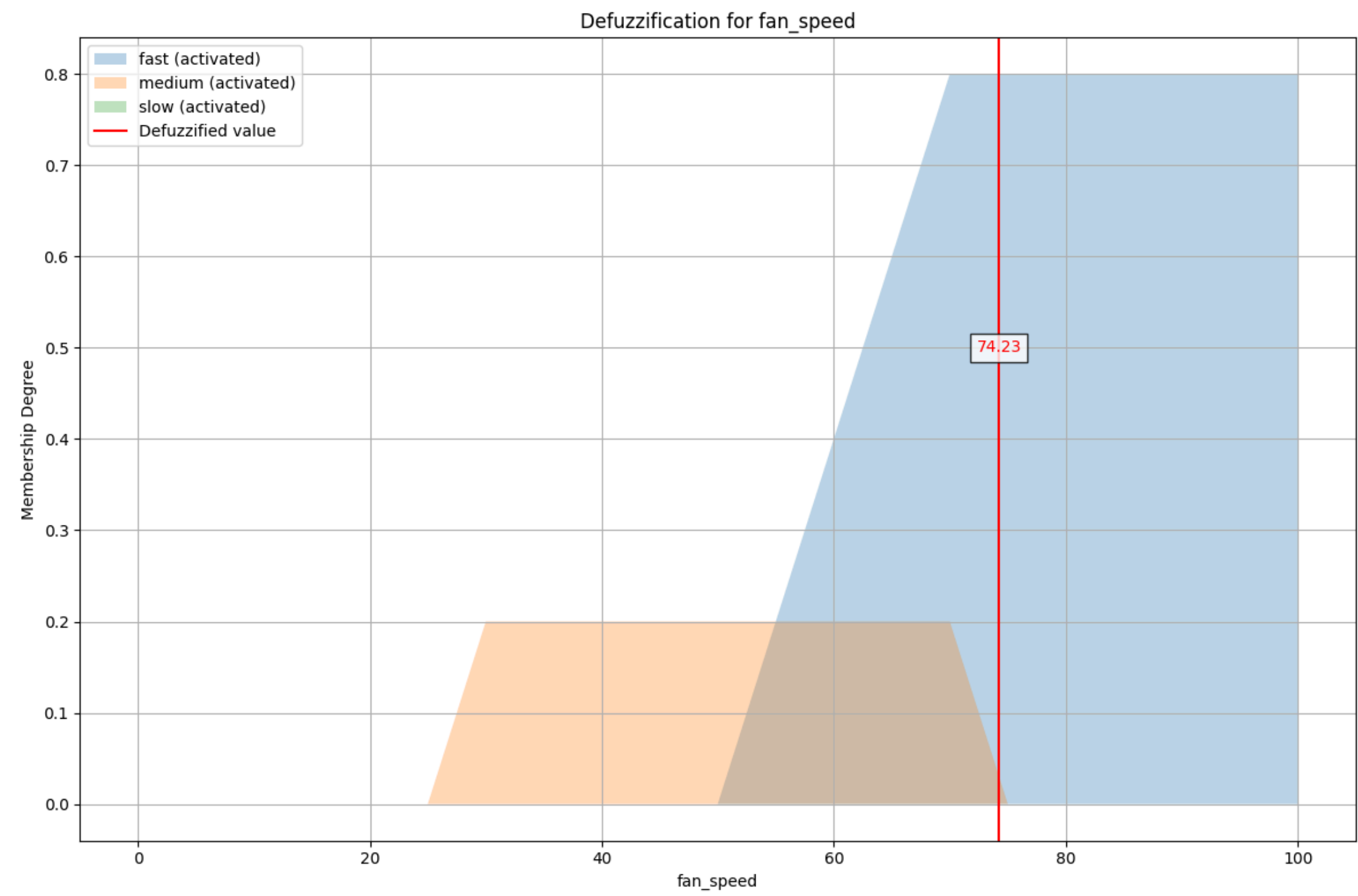
Membership functions



Inference



Defuzzification



Edge Detection with Fuzzy logic

Original image



Fuzzy Edge Detection



Thank You