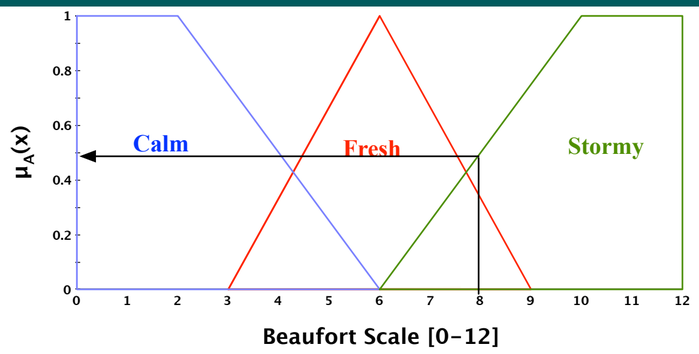
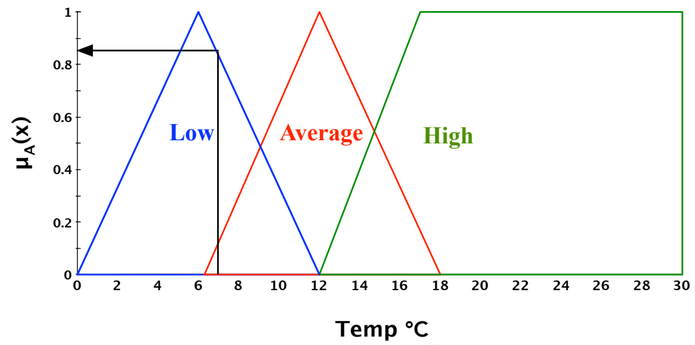
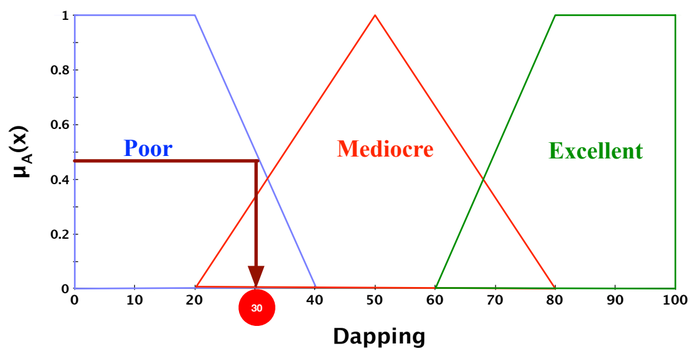
Tsukamoto Fuzzy Inference for Dapping, with inputs wind = 8, temperature = 7



$\mu_{stormy}(8) = 0.5, \therefore \mu_{extremely}(0.5) = 0.5^3 = 0.125$

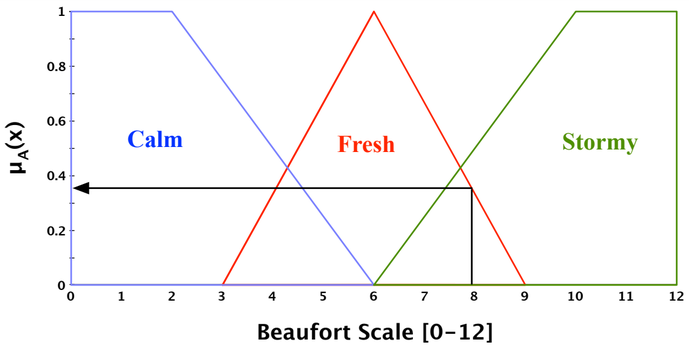


$\mu_{low}(7) = 0.85, \therefore \mu_{very}(0.85) = 0.85^2 = 0.722$

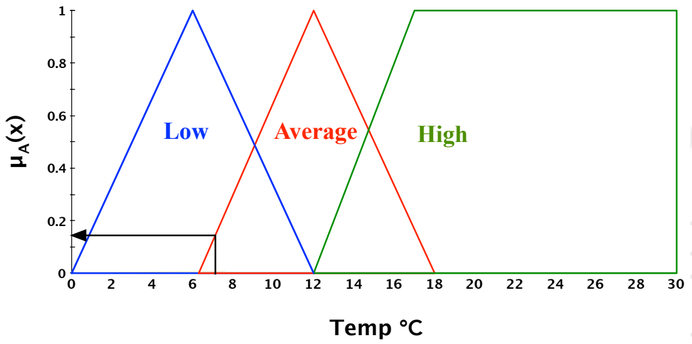


$\mu_{poor}(x) = \max(0.125, 0.722) = 0.722, \therefore \mu_{very}(0.722)^2 = 0.521, \therefore \text{Not} = 1 - 0.521 = 0.479$

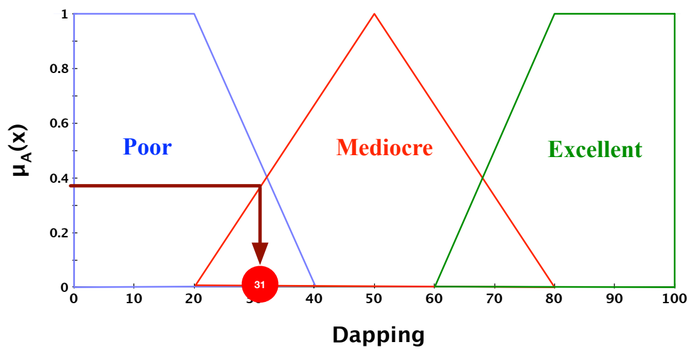
Rule 1: IF wind IS EXTREMELY stormy OR temp IS VERY low THEN dapping IS NOT VERY poor



$\mu_{fresh}(8) = 0.380$

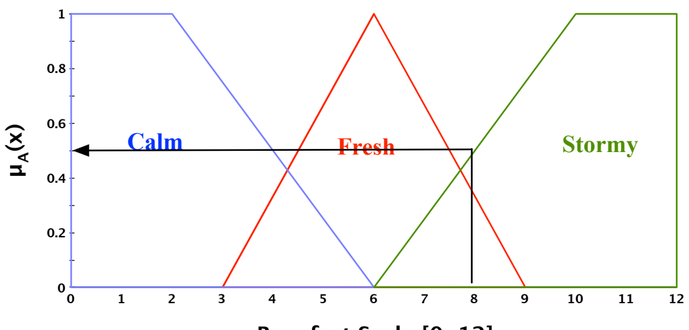


$\mu_{average}(7) = 0.15, \therefore \mu_{more\text{-}or\text{-}less}(0.15) = \text{sqrt}(0.15) = 0.387$

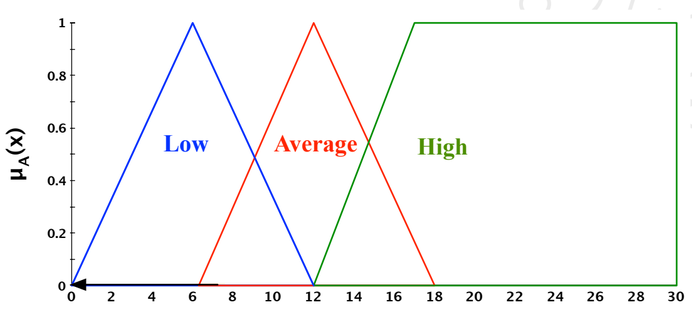


$\mu_{mediocre}(x) = \min(0.380, 0.387) = 0.38$

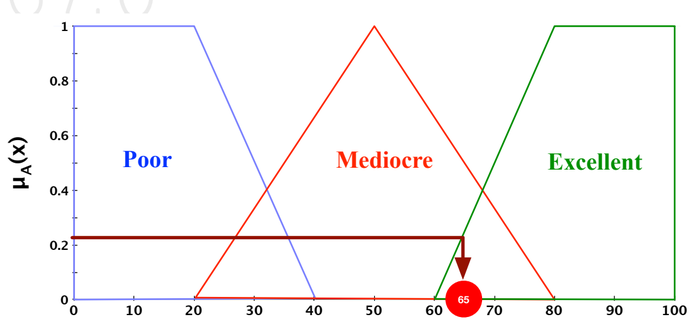
Rule 2: IF wind IS fresh AND temp IS MORE OR LESS average THEN dapping IS mediocre



$\mu_{stormy}(8) = 0.5, \therefore \mu_{slightly}(0.5) = 0.5^{1.7} = 0.307$



$\mu_{high}(7) = 0, \therefore \text{Not Low} = 1 - 0 = 1$



$\mu_{low}(x) = \min(0.307, 1) = 0.307, \therefore \mu_{little}(0.307) = 0.307^{1.3} = 0.215$

Rule 3: IF wind IS slightly stormy AND temp IS NOT high THEN dapping IS A LITTLE excellent

Tsukamoto inference uses a weighted average defuzzifier based on the minimum value from mapping the rule consequent fuzzy result to a fuzzy set in the output variable.

$$WA = \frac{\sum_{i=1}^{n} w_i z_i}{\sum_{i=1}^{n} w_i} = \frac{(35 \times 0.278) + (31 \times 0.38) + (65 \times 0.215)}{0.278 + 0.38 + 0.215} = \frac{40.125}{1.074}$$

= 37.36% Dappable