1.

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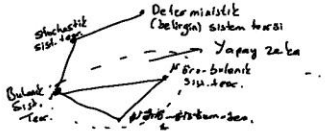
Bulanık Mantığa Giriş

Zadeh'in Genişletme Prensibi: Bütün crisp (kesin) teoriler bulanıklaştırılabilir.
(Any crisp theory can be fuzzified.)

Bulanık Sistem Teorisi



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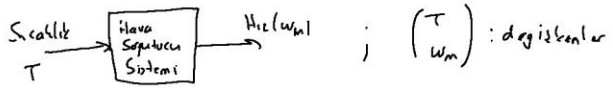
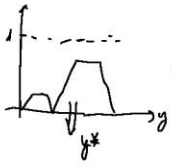
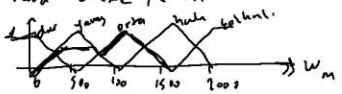
Örnek:



Sıcak ; soğuk, serin, normal, ılık, sıcak } dilsel (Linguistic) ifadeler.
Hız : dur, yavaş, orta, hızlı, çok hızlı }

Kurallar: R_1 = if hava SOĞUK, then motor hızı DUR.
R2 = eğer hava SERİN, then motor hızı YAVAŞ
⋮
R_j = ger hava SICAK, then motor hızı HIZLI





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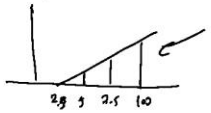
Bulanık Kümeler

Üyelik (derece) fonk.



Bulanık Yaklaşım

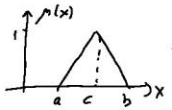
Üyelik Fonk. Özellikleri (μ)

Bazı Üyelik Fonk. Tipleri arasında seçer alabilirsiniz.

2.) Monoton artan ve/veya azalan fonksiyonlardır.

3.) Yerel (Local) fonk.

1.) Üçgen (triangular) Üyelik (Membership) Fonk



$$\mu(x;a,c,b)=\begin{cases}\frac{1}{c-a}(x-a) & a\le x<c\\ -\frac{1}{b-c}(x-b) & c\le x<b\\ 0 & \text{diğer}\end{cases}$$

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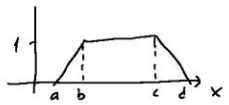
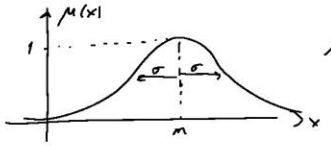
2.) Yamuk (Trapezoidal) Üyelik Fnk.



$$\mu(x;a,b,c,d)=\begin{cases}\frac{1}{b-a}(x-a) & a\le x<b\\ 1 & b\le x<c\\ -\frac{1}{d-c}(x-d) & c\le x<d\\ 0 & \text{diğer}\end{cases}$$

3.) Gauss Ü.F.



$$\mu(x;m,\sigma^2)=e^{-\left(\frac{x-m}{\sigma}\right)^2}$$

NOT: Gauss (Normal) Dağılım

$$p(x)=\frac{1}{\sqrt{2\pi}\,\sigma}\cdot e^{-\frac{1}{2}\left(\frac{x-m}{\sigma}\right)^2}$$

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Matlab: x= 1.8 →

m_1 = trimf (x, [1.8 3.5 4.8]);

m_2 = trapmf (x, [0.5 1 1.5 2]);

m_3: gaussmf (x, [4 6]);