**Membership function example**

% CONSTANTS

x=-0.8:0.01:0.2;

y=0:0.01:1;

% membership functions - error (input)

%Eng

a=-0.5;b=-0.3;

FEng=(x>a&x<=b).\*((b-x)/(b-a))+(x<=a).\*(1);

%Enm

c=-0.5; d=-0.3 ;e=-0.1;

FEnm= (x>=c&x<=d).\*((x-c)/(d-c))+(x>d&x<=e).\*((e-x)/(e-d));

%Enp

f=-0.3; g=-0.15; h=0;

FEnp= (x>=f&x<=g).\*((x-f)/(g-f))+(x>g&x<=h).\*((h-x)/(h-g));

%Ec

i=-0.1; j=0;k=0.1;

FEc= (x>=i&x<=j).\*((x-i)/(j-i))+(x>j&x<=k).\*((k-x)/(k-j));

%Epp

l=0;m=0.1;

FEpp=(x>l&x<m).\*((x-l)/(m-l))+(x>=m).\*(1);

% membership functions - pressure (output)

%nPmc

A=0.1;B=0.2;

FnPmc=(y>A&y<=B).\*((B-y)/(B-A))+(y<=A).\*(1);

%pocaPmc

C=0.1; D=0.3;E=0.5;

FpPmc= (y>=C&y<=D).\*((y-C)/(D-C))+(y>D&y<=E).\*((E-y)/(E-D));

%mPmc

F=0.35; G=0.5;H=0.65;

FmPmc= (y>=F&y<=G).\*((y-F)/(G-F))+(y>G&y<=H).\*((H-y)/(H-G));

%casiPmc

I=0.5; J=0.7;K=0.9;

FcPmc= (y>=I&y<=J).\*((y-I)/(J-I))+(y>J&y<=K).\*((K-y)/(K-J));

%Pmc

L=0.8;M=0.9;

FPmc=(y>L&y<M).\*((y-L)/(M-L))+(y>=M).\*(1);

**Definition of membership functions - input (slip error)**

Diagrama

Descripción generada automáticamente con confianza media

**Definition of membership functions - output(Presión)**

Interfaz de usuario gráfica

Descripción generada automáticamente

**Control Rules**

|  |  |
| --- | --- |
| Slip Error | Pressure |
| Eng | pocaPcm |
| Enm | mPcm |
| Enp | casiPcm |
| Ec | Pcm |
| Epp | Pcm |

Alternativa

|  |  |
| --- | --- |
| Slip Error | Pressure |
| Eng | nPmc |
| Enm | pPcm |
| Enp | mPcm |
| Ec | cPcm |
| Epp | Pcm |

|  |  |  |  |
| --- | --- | --- | --- |
|  | Slip Error |  | Pressure |
| If | **Eng** | then | **nPmc** |
| If | **Enm** | then | **pPcm** |
| If | **Enp** | then | **mPcm** |
| If | **Ec** | then | **cPcm** |
| If | **Epp** | then | **Pcm** |

**Useful Resources**

<https://www.youtube.com/watch?v=JP24ACpsxLk>

<https://www.youtube.com/watch?v=qR9NPQC3O88>

<https://www.youtube.com/watch?v=G0KJA3JUrns>