

File st45_mf.m

```
function mf = st45_mf(x, abcd)
% st45 MF is a symmetrical trapazoid mf with 45 degree angles.
% st45 takes 2 inputs,
%     x     - which is the value to fuzzify, and
%     abcd  - which is a vector of 2 parameters that
%             define the left and right side of the
%             trapazoidal membership function.
%
% It is useful to simplify fuzzy controller tuning
% because it only takes 2 parameters to define the mf.
%
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%
% Project   : Fuzzy Logic Controler for the Inverted Pendulum Problem
% Soft Computing
% Instructors: Kai Goebel / Bill Cheetham
%
% MF
% This function helps to calculate the output membership functions for the 5^4
% fuzzy login controler.
%
% a = left side
a = abcd(1);
%
% d = right side
d = abcd(2);
%
temp = abs((d-a)/3);
%
% b = left sideof core
b = (a + temp);
%
% c = right side of core
c = (a + 2*temp);
%
% assemble parameters into the format trap_mf likes
abcd = [a b c d];
%
% call trap_mf with new expanded parameters
mf = trap_mf(x, abcd);
```