

## Supplementary. (m-file) MATLAB File for Fuzzy Model

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function [z0, z1, z2, z3, z4, z5, z6, z7, z8, z9, z10, z11, z12, z13] = Kood2
filename='Intellectual.xlsx'
z12=0;
z13=0;
yi=0;
y2=0;
y3=0;
y4=0;
x3=0;
x4=0;
z0=xlsread(filename);
z3 = [0.15,0.35,0.45,0.75];
a=z0;
[x,y]=size(a);
a1=11;
a2=7;
a3=8;
a4=9;
a5=21;

%ATD matrix
for j=1:y
    z1(1,j)=a(1,j)/a1;
    z1(2,j)=a(2,j)/a2;
    z1(3,j)=a(3,j)/a3;
    z1(4,j)=a(4,j)/a4;
    z1(5,j)=a(5,j)/a5;
end
%Standard deviation and average mean
for j=1:y
    z2(1,j)=(z1(1,j)+z1(2,j)+z1(3,j)+z1(4,j)+z1(5,j))/x;
    z2(2,j)=std(z1(:,j));
end
%RTD matrix
for n=1:4
    for i=1:x
        for j=1:y
            if z1(i,j) <= (z2(1,j) - z3(n)*z2(2,j))
                x3(i,j)=-1;
            elseif z1(i,j) >= (z2(1,j) + z3(n)*z2(2,j))
                x3(i,j)=1;
            elseif (z1(i,j) > (z2(1,j) - z3(n)*z2(2,j))) & (z1(i,j) < ((z2(1,j) + z3(n)*z2(2,j)
j))))
                x3(i,j)=0;
            end
        end
    end
end
if (n==1) z4=x3;
elseif (n==2) z5=x3;
elseif (n==3) z6=x3;
elseif (n==4) z7=x3;
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        end

end

%Raw Sum matrix
z8=[sum(z4(1,:)); sum(z4(2,:)); sum(z4(3,:)); sum(z4(4,:)); sum(z4(5,:))];
z9=[sum(z5(1,:)); sum(z5(2,:)); sum(z5(3,:)); sum(z5(4,:)); sum(z5(5,:))];
z10=[sum(z6(1,:)); sum(z6(2,:)); sum(z6(3,:)); sum(z6(4,:)); sum(z6(5,:))];
z11=[sum(z7(1,:)); sum(z7(2,:)); sum(z7(3,:)); sum(z7(4,:)); sum(z7(5,:))];

z12=z4+z5+z6+z7;
z13=[sum(z12(1,:)); sum(z12(2,:)); sum(z12(3,:)); sum(z12(4,:)); sum(z12(5,:))];

% interpolacija grafika
x=[20.5 29 36.5 45 60.5]
xi=20.5:0.1:60.5;
%plot(x,z8)
%hold on
%plot(x,z9,'r')
%hold on
%plot(x,z10,'y')
%hold on
%plot(x,z11, 'g');
yi=interp1(x,z8,xi,'spline');
subplot(2,1,1);
plot (x,z8,'*k',xi,yi,'r', [0 70], [0 0], 'k-')
hold on
y2=interp1(x,z9,xi,'spline');
plot (x,z9,'*k',xi,y2,'g', [0 70], [0 0], 'k-')
hold on
y3=interp1(x,z10,xi,'spline');
plot (x,z10,'*k',xi,y3,'y', [0 70], [0 0], 'k-')
hold on
y4=interp1(x,z11,xi,'spline');
plot (x,z11,'*k',xi,y4,'b', [0 70], [0 0], 'k-');
axis ([0 70 -20 25])
hold off
x=[20.5 29 36.5 45 60.5]
xi=20.5:0.1:60.5;
yi=interp1(x,z13,xi,'spline');
subplot(2,1,2);
plot(x,z13,'*k',xi,yi,'r', [0 70], [0 0], 'k-');
axis ([0 70 -50 60])

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