

EX: 6

FUZZY LOGIC - IMAGE PROCESSING

Aim:

To implement a program for
Fuzzy logic- Image processing.

Code:

```
Irgb = imread('peppers.png');  
Igray = rgb2gray(Irgb);  
image(Igray, 'cDataMapping', 'scaled')  
colormap('gray')  
title('Input Image in grayscale')  
I = im2double(Igray);  
Ix = [-1, 1];  
Iy = Ix';  
IX = conv2(I, Ix, 'same');  
Iy = conv2(I, Iy, 'same');  
image(IX, 'cDataMapping', 'scaled')  
colormap('gray')  
title('IX')  
image(Iy, 'cDataMapping', 'scaled')  
colormap('gray')  
title('Iy')  
edgeFIS = mamfis('Name', 'edgeDetection');  
edgeFIS = addInput(edgeFIS, [-1, 1],  
    'Name', 'Ix');  
edgeFIS = addInput(edgeFIS, [-1, 1],  
    'Name', 'Iy');
```



```
Sx = 0.1;  
Sy = 0.1;  
edgeFIS = addMF(edgeFIS, 'Ix', 'gaussmf',  
[Sx 0], 'Name', 'zero');  
edgeFIS = addMF(edgeFIS, 'Iy',  
'gaussmf', [Sy 0], 'Name', 'zero');  
edgeFIS = addOutput(edgeFIS, [0 1],  
'Name', 'Iout');  
wa = 0.1;  
wb = 1;  
wc = 1;  
ba = 0;  
bb = 0;  
bc = 0.7;  
edgeFIS = addMF(edgeFIS, 'Iout', 'trimf',  
[wa wb wc], 'Name', 'white');  
edgeFIS = addMF(edgeFIS, 'Iout', 'trimf',  
[ba bb bc], 'Name', 'black');  
subplot(2,2,1)  
plotmf(edgeFIS, 'input', 1)  
title('Ix')  
subplot(2,2,2)  
plotmf(edgeFIS, 'input', 2)  
title('Iy')  
subplot(2,2,[3 4])  
plotmf(edgeFIS, 'output', 1)  
title('Iout')  
r1 = "If Ix is zero and Iy is zero  
then Iout is white";  
r2 = "If Ix is not zero or Iy is  
not zero then Iout is black";  
edgeFIS = addRule(edgeFIS, [r1 r2]);
```


edge FIS. Rules

ans = 1x2 FIS rule array with properties

Ieval = zeros (size (I));

for ii = 1:size (I,1)

Ieval(ii,:) = evalfis (edge FIS, [Ix(ii,:),
Iy(ii,:)])';

end

image (I, 'C Data Mapping', 'Sealed')

colormap ('gray')

title ('Original Grayscale Image')

image (Ieval, 'C Data Mapping', 'Sealed')

colormap ('gray')

title ('Edge detection using Fuzzy
Logic')

Result:

The program for fuzzy logic is implemented & the output is prepared.