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Tugas Pemrosesan Citra Biomedis

## 1. Tugas 1

### A. Sobel

```
clc;close all;clear
I = imread('mawar.jpg');
H=fspecial('sobel');
H=H';
J = imfilter(I,H);
imshowpair(I,J,'montage')
```



### B. Prewit

```
clc;close all;clear
I = imread('mawar.jpg');
H=fspecial('prewitt');
J = imfilter(I,H);
imshowpair(I,J,'montage')
```



### C. Segmentation

```
clear;clc;close all;
RGB = imread('mawar.jpg');

%Determine if Img must be converted to 2 dimension
if size(RGB, 3) > 1
    gray = RGB;
    bw = RGB;
```

```

else
    bw = RGB;
end

%---Point and Line Segmentation---%
%KERNEL
point = [-1 -1 -1; -1 8 -1; -1 -1 -1]; % Titik
hor = [-1 -1 -1; 2 2 2; -1 -1 -1]; % Garis Horizontal
di_up = [-1 -1 2; -1 2 -1; 2 -1 -1]; % Garis +45
di_down = [2 -1 -1; -1 2 -1; -1 -1 2]; % Garis -45
ver = [-1 2 -1; -1 2 -1; -1 2 -1]; % Garis Vertikal

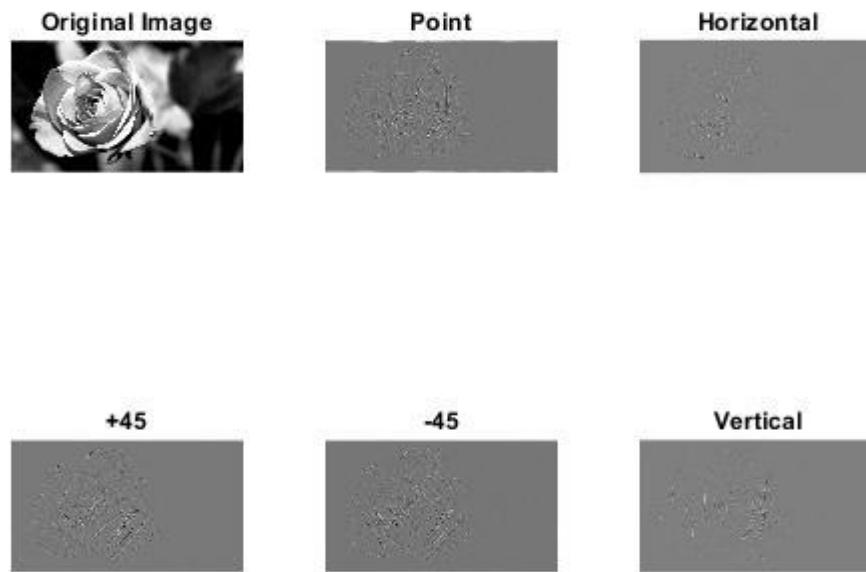
%Convolution Process with Manual Kernel
conv_point = conv2(point, bw);
conv_hor = conv2(hor, bw);
conv_up = conv2(di_up, bw);
conv_down = conv2(di_down, bw);
conv_ver = conv2(ver, bw);

%---Edge Detection---%
% %KERNEL for Manual Input
% SxSobel = [ -1 0 1 ; -2 0 2; -1 0 1 ];
% SxSobel = [ 1 2 1 ; 0 0 0 ; -1 -2 -1 ];
% perX = [ -1 0 1 ; -1 0 1; -1 0 1 ];
% perY = [ 1 1 1 ; 0 0 0; -1 -1 -1 ];
% robX = [ 1 0 ; 0 -1 ];
% robY = [ 0 1 ; -1 0 ];

%With Function/Toolbox

%---PLOTTING---%
%Point and Line Plot
figure(1);
subplot(2,3,1), imshow(RGB); title('Original Image');
subplot(2,3,2), imshow(conv_point, []); title('Point');
subplot(2,3,3), imshow(conv_hor, []); title('Horizontal');
subplot(2,3,4), imshow(conv_up, []); title('+45');
subplot(2,3,5), imshow(conv_down, []); title('-45');
subplot(2,3,6), imshow(conv_ver, []); title('Vertical');

```



## 2. Tugas K Means

Matlab:

```
clc;clear all; close all

X=[1 1; 4 1;6 1;1 2;2 3;5 3; 2 5;3 5; 2 6;3 8];
figure;
plot(X(:,1),X(:,2),'*')
title 'randomly Generated Data'
opts = statset('Display','final');
[idx,C] = kmeans(X,3,'Distance','cityblock',...
    'Replicates',5,'Options',opts);

figure;
plot(X(idx==1,1),X(idx==1,2),'r.','MarkerSize',12)
hold on
plot(X(idx==2,1),X(idx==2,2),'b.','MarkerSize',12)
plot(C(:,1),C(:,2),'kx',...
    'MarkerSize',15,'LineWidth',3)
legend('Cluster 1','Cluster 2','Centroids',...
    'Location','NW')
title 'Cluster Assignments and Centroids'
hold off
```

Hasil:

