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Tugas Pemrosesan Citra Biomedis

1. Operasi Titik
   a. Contrast stretching
      Syantax yang biasa digunakan adalah `B= imadjust(I, stretchlim(I),[])`
      Matlab :

```
clc;close all;clear
I = imread('mawar.jpg');
J= imadjust(I,stretchlim(I,[.02 .80]),[]);
imshowpair(I,J,'montage')
```

   b. Power low transform
      Matlab :

```
clc;close all;clear
I = imread('mawar.jpg');
p=double(I);
% figure,imshow(p/255)
[rowi,coli]=size(p);
r=0:1:255
gamma=0.5;
c=1.5;
s=c*r.^gamma
out=zeros(rowi,coli);
for k=1:256
    for i=1:rowi
        for j=1:coli
if p(i,j)==r(k)
    out(i,j)=s(k);
% else
%     break
end
        end
    end
end
% out
% figure,imshow(uint8(out))
% figure,imshow(out/255)
imshowpair(I,uint8(out),'montage')
```

c. Log transform

Matlab :

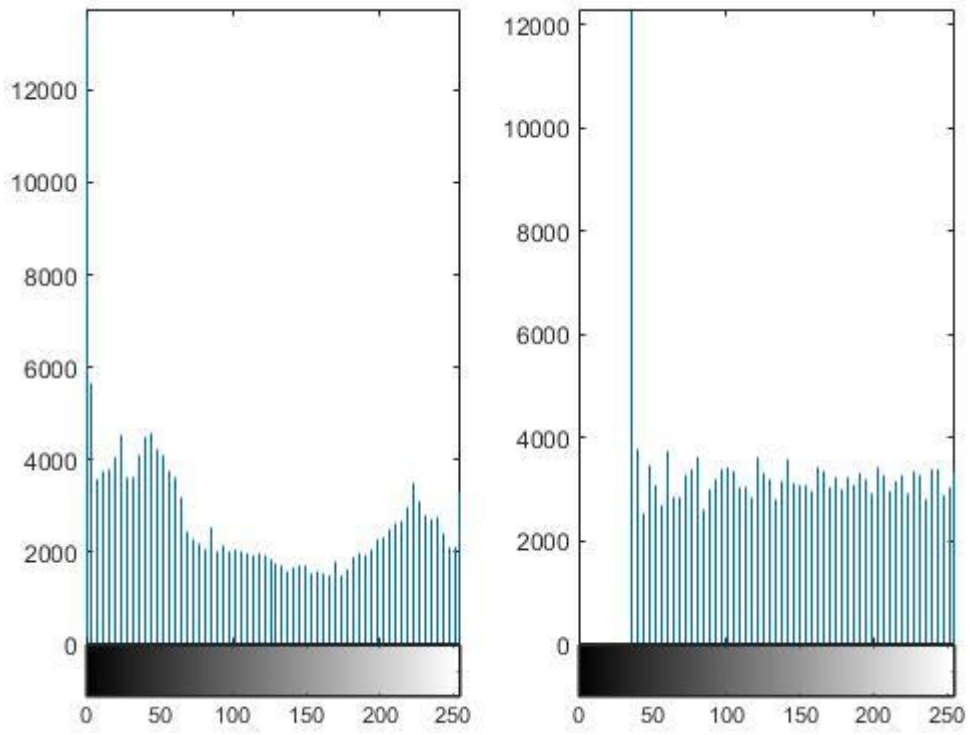
```
clc;close all;clear
I = imread('mawar.jpg');
g=I;
[M,N]=size(g);
        for x = 1:M
            for y = 1:N
                m=double(g(x,y));
                z(x,y)=1e-6.*log10(1+m);
            end
        end
imshowpair(I,z,'montage')
```

d. Histogram equalization

Syantax yang biasa digunakan adalah `B= histteq(I)`

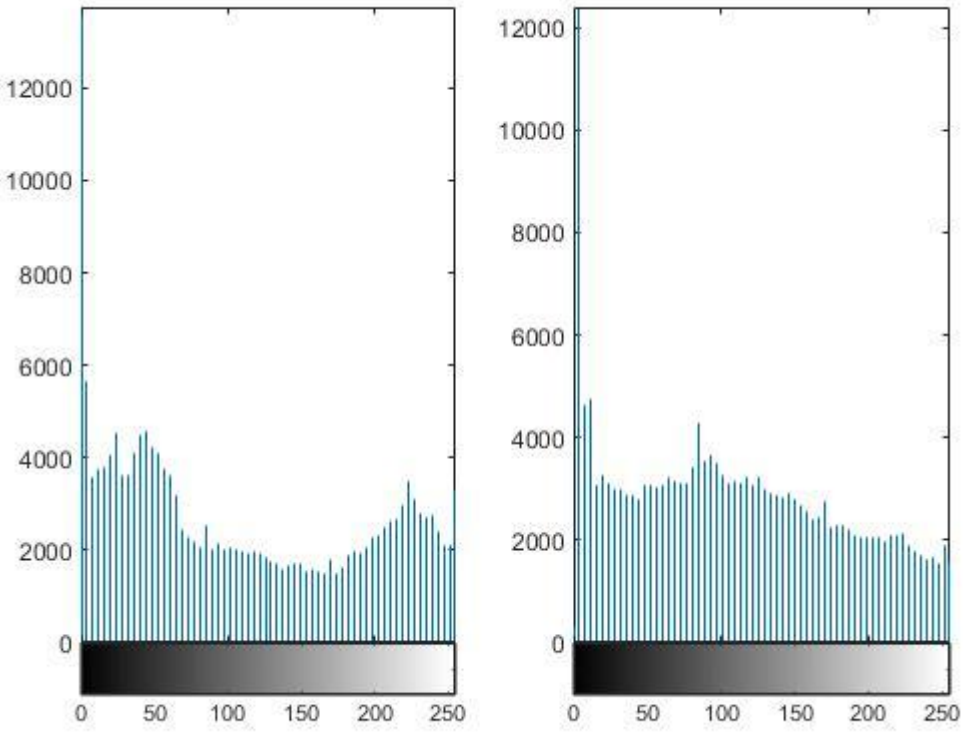
Matlab :

```
clc;close all;clear
I = imread('mawar.jpg');
J = histeq(I);
imshowpair(I,J,'montage')
figure, subplot(1,2,1)
imhist(I,64)
subplot(1,2,2)
imhist(J,64)
```




e. Adaptive histogram equalization
Syantax yang biasa digunakan adalah `B= adapthisteq(I)`
Matlab :

```
clc;close all;clear
I = imread('mawar.jpg');
J = adapthisteq(I);
imshowpair(I,J,'montage')
figure, subplot(1,2,1)
imhist(I,64)
subplot(1,2,2)
imhist(J,64)
```




2. Filtering
   a. Linier
      1. Mean filter

         Syantax yang biasa digunakan adalah `B= filter2(H,I)`

         Matlab :

```
clc;close all;clear
%%% High Pass Filter
I = imread('mawar.jpg');
h = 1/2*ones(8,1);
H = h*h';
J= filter2(H,I);
imshowpair(I,J,'montage')
```

2. Gaussian filter
   Syantax yang biasa digunakan adalah `B= imgausfilt(A,h)`
   Matlab :

```
clc;close all;clear
%%% High Pass Filter
I = imread('mawar.jpg');
J=imgaussfilt(I,1.5);
imshowpair(I,J,'montage')
```

3. High pass filter
   Syantax yang biasa digunakan adalah `B= imfilter(A,h)`
   Matlab :

```
clc;close all;clear
%%% High Pass Filter
I = imread('mawar.jpg');
h=[0 -1 0; -1 5 -1; 0 -1 0];
J= imfilter(I,h,'conv');
subplot(1,2,1)
imshow(I)
subplot(1,2,2)
imshow(J)
```


4. Low pass filter

   Syantax yang biasa digunakan adalah `B= imfilter(A,h)`

   Matlab :

```
clc;close all;clear
%%% Low Pass Filter
I = imread('mawar.jpg');
h=[1 0 -1; 2 -2 0; -3 1 2];
J= imfilter(I,h,'conv');
subplot(1,2,1)
imshow(I)
subplot(1,2,2)
imshow(J)
```


b. Non Linier

1. Median filter

   Sytax : `J= Medfilt2(I)`

   Matlab :

```
clc;close all;clear
%%% High Pass Filter
I = imread('mawar.jpg');
J = imnoise(I,'salt & pepper',0.1);
```

```
K = medfilt2(J);
imshowpair(J,K,'montage')
```

2. Konservatif filter

   Menggunakan syntax `nlfilter`

   A. Konservatif max filter

```
clc;close all;clear
%%% High Pass Filter
I = imread('mawar.jpg');
J= nlfilter(I, [3,3],'max(x(:))');
imshowpair(I,J,'montage')
```

   B. Konservatif min filter

```
clc;close all;clear
%%% High Pass Filter
I = imread('mawar.jpg');
J= nlfilter(I, [50,50],'min(x(:))');
imshowpair(I,J,'montage')
```

3. Kwahara filter
   Syntax : `Y = kuwahara(X, WINSZ,progress)`

3. Operasi Geometri
   a. Translasi
      Menggunakan syntax `imtranslate`

```
clc;close all;clear
%%% High Pass Filter
I = imread('mawar.jpg');
J= imtranslate(I,[50, 50]);
imshowpair(I,J,'montage')
```

   b. Rotasi
      Menggunakan syntax `imrotate`

```
clc;close all;clear
%%% High Pass Filter
I = imread('mawar.jpg');
J= imrotate(I, 45,'bilinear','crop');
imshowpair(I,J,'montage')
```

   c. Perbesaran
      Menggunakan syntax `imresize`

```
clc;close all;clear
%%% High Pass Filter
I = imread('mawar.jpg');
J= imresize(I, 0.5);
imshowpair(I,J,'montage')
```

d. Flipping

Menggunakan syntax `flipdim`

```
clc;close all;clear
%%% High Pass Filter
I = imread('mawar.jpg');
J= flipdim(I, 2);
imshowpair(I,J,'montage')
```