

Digital Image Processing – CSCI/CMPE 4301

Assignment 03: Mask Convolution

1. Write a function in Matlab (or Java) as follows:

```
Detect edges
```

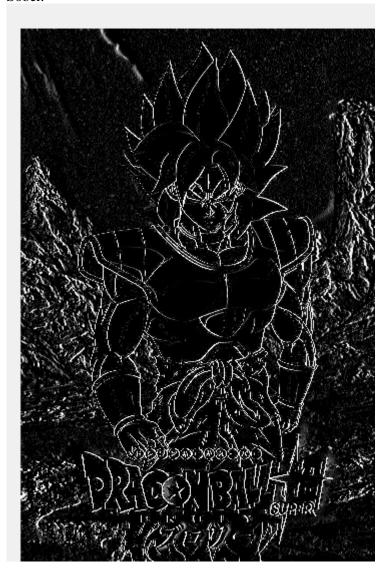
end

```
function edges(Image)
img =imread(Image);
figure, imshow(img);
robertx=[1 0; 0 -1];
roberty=[0 1;-1 0];
sobelx=[-1 0 1; -2 0 2; -1 0 1];
sobely=[-1 -2 -1;0 0 0; 1 2 1];
prewittx=[-1 0 -1; -1 0 1; -1 0 1];
prewitty=[-1 -1 -1;0 0 0; 1 1 1];
robert=abs(convolution(img,robertx))+abs(convolution(img,roberty));
sobel=abs(convolution(img, sobelx)) + abs(convolution(img, sobely));
prewitt=abs(convolution(img,prewittx))+abs(convolution(img,prewitty));
figure, imshow(robert);
figure, imshow (prewitt);
figure, imshow(sobel);
      Convolution operation
function Img2=convolution(Img, mask)
Img2=rgb2gray(Img);
Img3=double(Img2);
[a, b] = size(Imq3);
[n, \sim] = size(mask);
for i=1:a-2
    for j=1:b-2
        conv=Img3(i:i+(n-1),j:j+(n-1))*mask;
        s=sum(sum(conv));
        Img2(i,j)=s;
    end
```

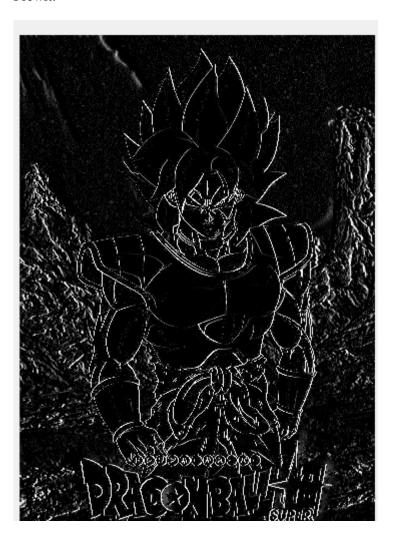
2. Test the function.

Read an image file, apply the edge detection filters (i.e., masks) to see whether it works well. Try at least 3 filters: Sobel, Robert, Prewitt.

Sobel:



Prewit:



Roboyto:

