OpenCV DIP

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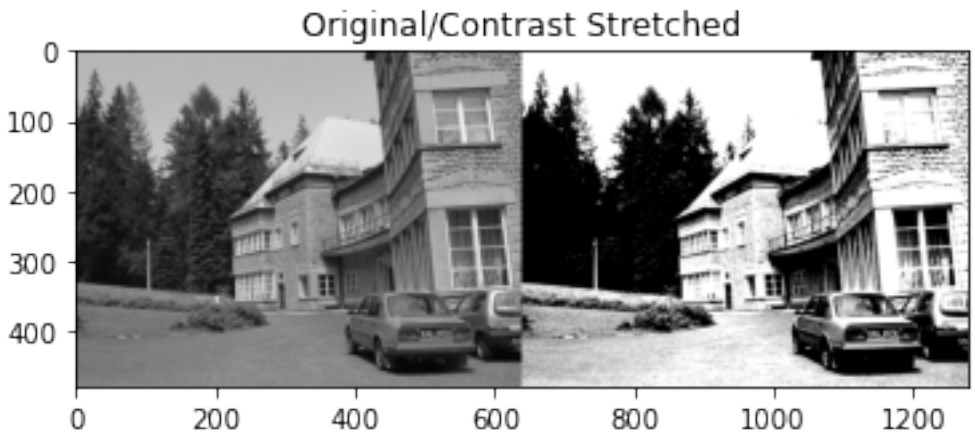
April 11, 2020

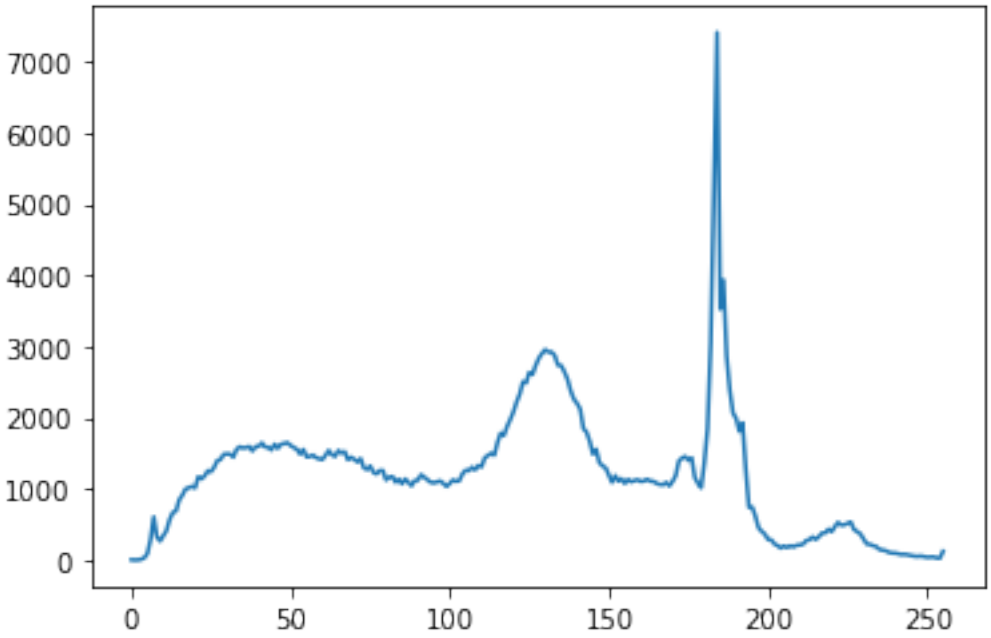
[14]:
```
import cv2
import numpy as np
from matplotlib import pyplot as plt
```

[15]:
```
#Created by Mohd Kashaf Siddiuqi On Jupyter Notebook
```

[16]:
```
def pixelVal(pix, r1, s1, r2, s2):
    if (0 <= pix and pix <= r1):
        return (s1 / r1)*pix
    elif (r1 < pix and pix <= r2):
        return ((s2 - s1)/(r2 - r1)) * (pix - r1) + s1
    else:
        return ((255 - s2)/(255 - r2)) * (pix - r2) + s2
img = cv2.imread('test2.jpg',0)
r1 = 70
s1 = 0
r2=140
s2 = 255
pixelVal_vec = np.vectorize(pixelVal)
contrast_stretched = pixelVal_vec(img, r1, s1, r2, s2)
equ=np.hstack((img,contrast_stretched))
plt.title("Original/Contrast Stretched")
plt.imshow(equ,'gray')
plt.show()
```

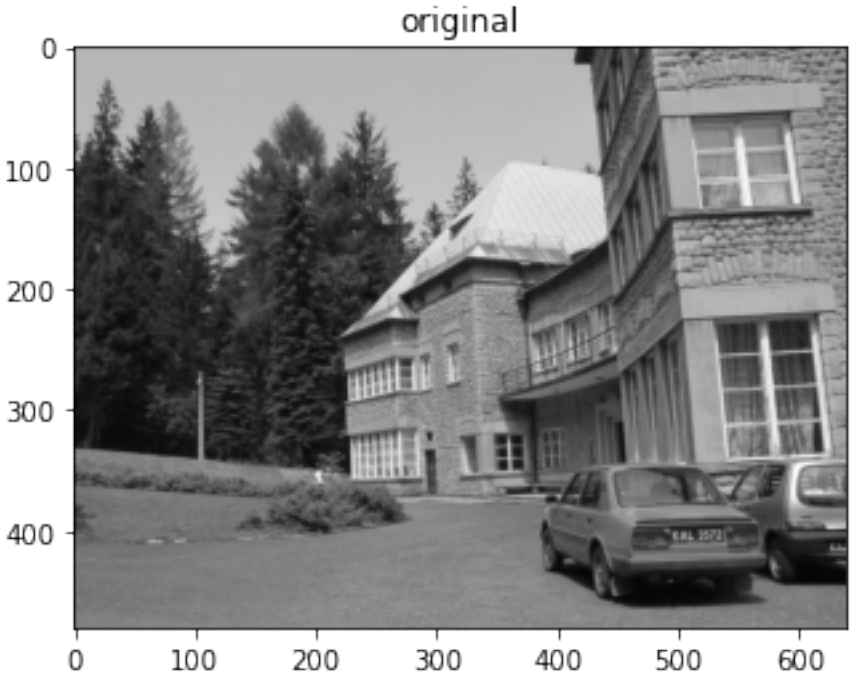


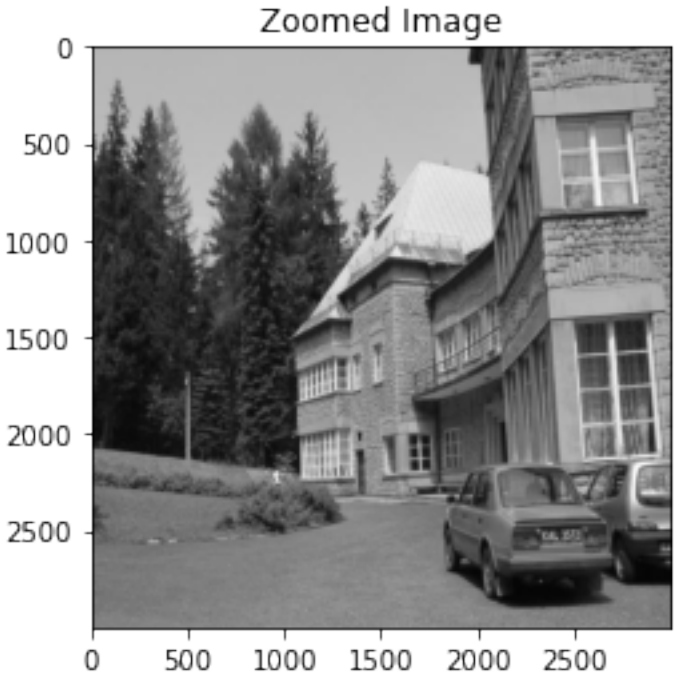
[17]:
```
histr = cv2.calcHist([img],[0],None,[256],[0,256])

# show the plotting graph of an image
plt.plot(histr)
plt.show()
```



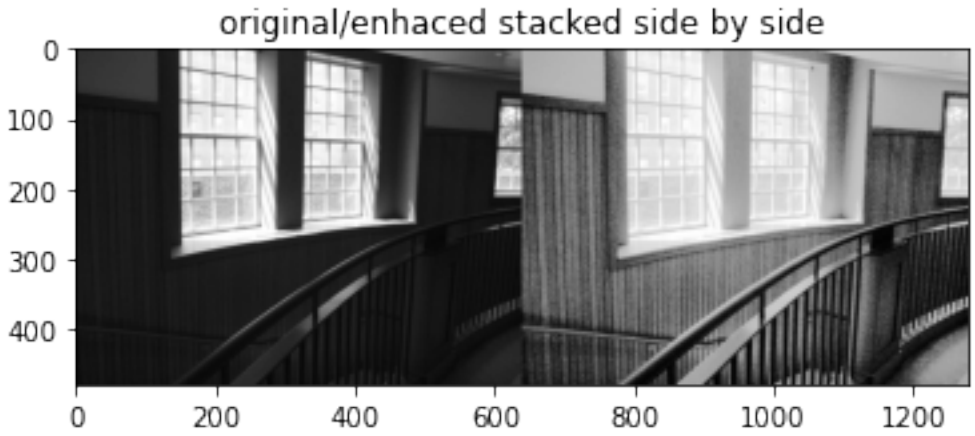
[18]:
```
stretch_near = cv2.resize(img, (3000,3000),
               interpolation = cv2.INTER_NEAREST)
plt.title('original')
plt.imshow(img,'gray')
```

```
plt.show()
plt.title('Zoomed Image')
plt.imshow(stretch_near,'gray')
plt.show()
```

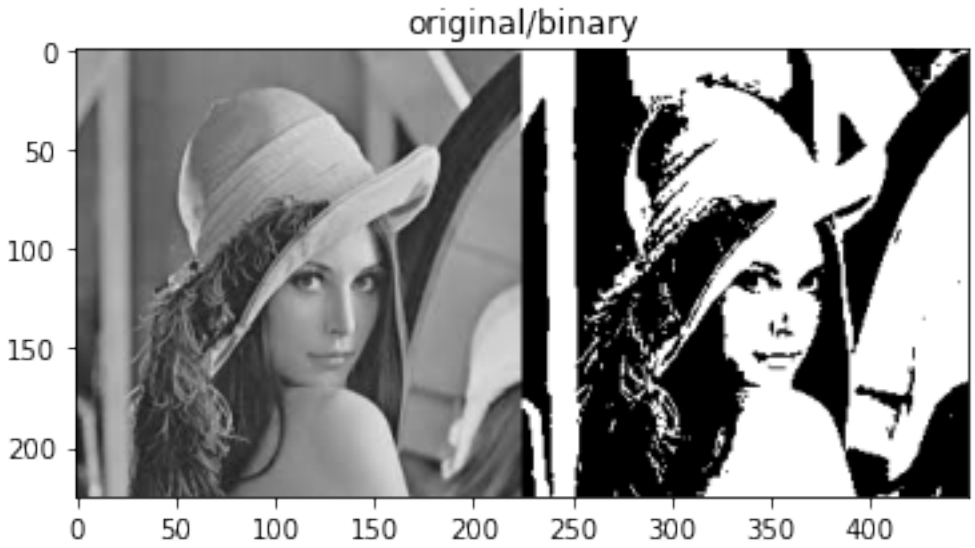




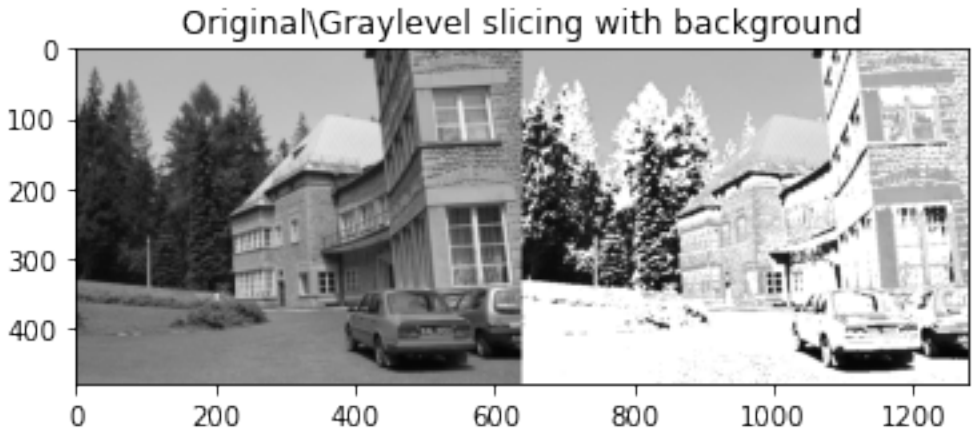
[19]:
```
img = cv2.imread('test1.jpg',0)
equ = cv2.equalizeHist(img)
res = np.hstack((img, equ))
plt.title("original/enhaced stacked side by side")
plt.imshow(res,'gray')
plt.show()
```



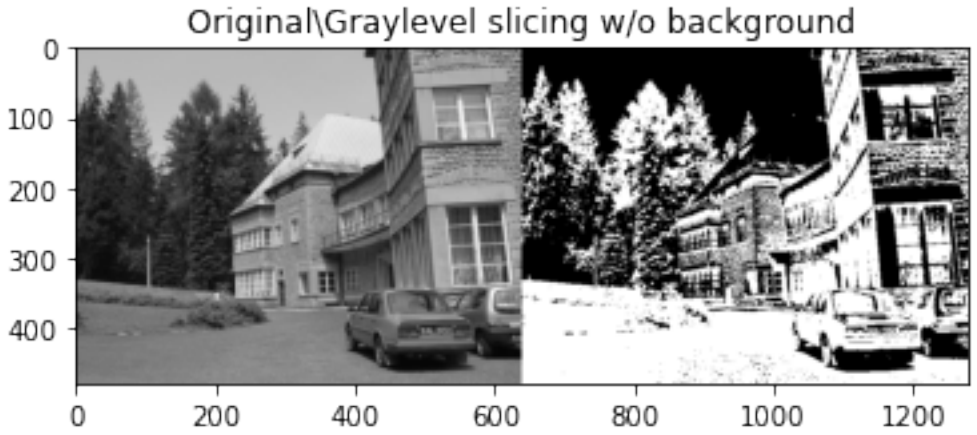
[20]:
```
image=cv2.imread("test.jpg",0)
x,y=image.shape
th=np.sum(image)/(x*y)
binary=np.zeros((x,y),np.double)
binary=(image>=th)*255
binary=binary.astype(np.uint8)
plt.title("original/binary")
equ=np.hstack((image,binary))
plt.imshow(equ,'gray')
plt.show()
```



[21]:
```
image=cv2.imread('test2.jpg',0)
x,y=image.shape
z=np.zeros((x,y))
for i in range(0,x):
    for j in range(0,y):
        if(image[i][j]>50 and image[i][j]<150):
            z[i][j]=255
        else:
            z[i][j]=image[i][j]
equ=np.hstack((image,z))
plt.title('Original\Graylevel slicing with background')
plt.imshow(equ,'gray')
plt.show()
```

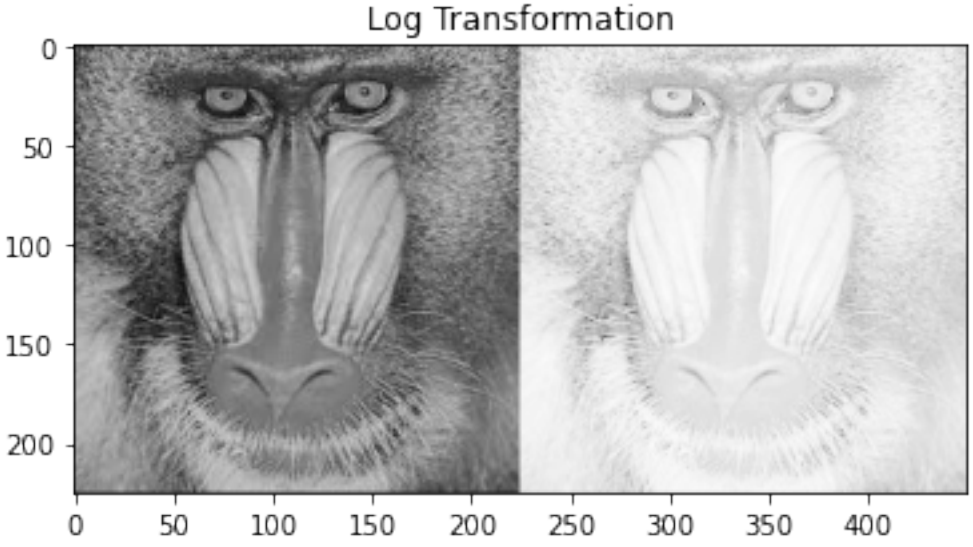


[22]:
```
image=cv2.imread('test2.jpg',0)
x,y=image.shape
z=np.zeros((x,y))
for i in range(0,x):
    for j in range(0,y):
        if(image[i][j]>50 and image[i][j]<150):
            z[i][j]=255
        else:
            z[i][j]=0
equ=np.hstack((image,z))
plt.title('Original\Graylevel slicing w/o background')
plt.imshow(equ,'gray')
plt.show()
```

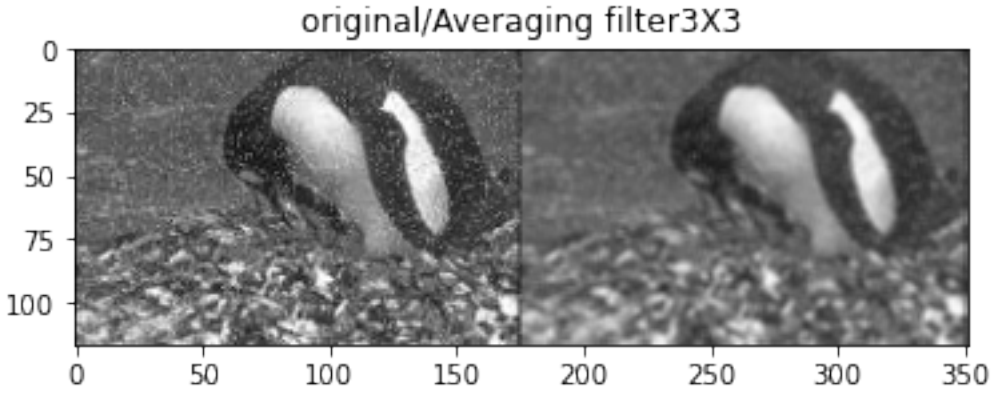


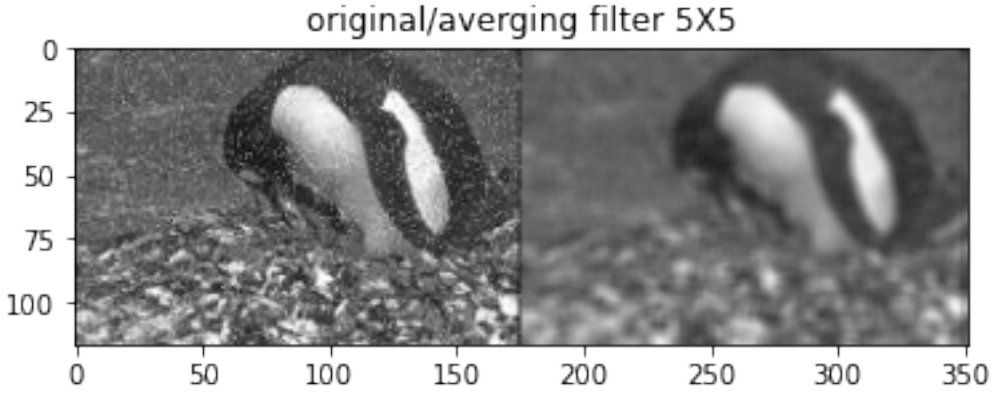
[23]:
```
image=cv2.imread('test.jpg',0)
x,y=image.shape
z=255-image
equ=np.hstack((image,z))
plt.title('Original\Image Negative')
plt.imshow(equ,'gray')
plt.show()
```

[24]:
```
image=cv2.imread('test.png',0)
x,y=image.shape
c=255/(np.log(1+np.max(image)))
z=c*np.log(1+image)
z=np.array(z,dtype=np.uint8)
equ=np.hstack((image,z))
plt.title('Log Transformation')
plt.imshow(equ,'gray')
plt.show()
```



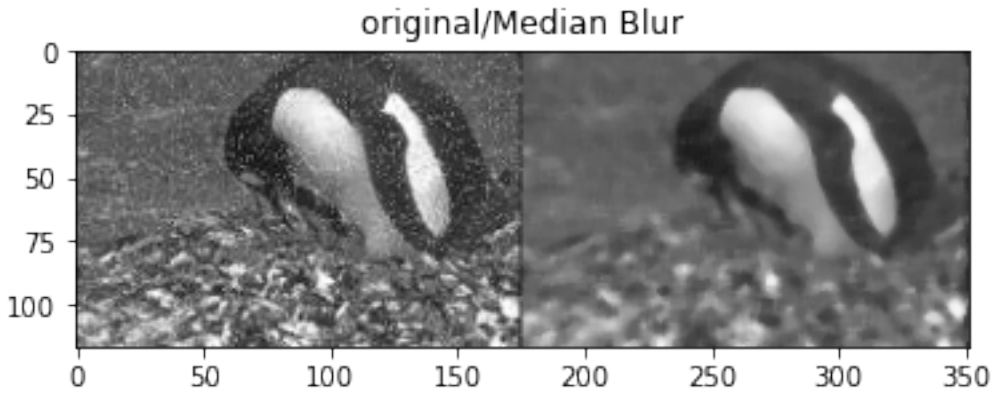
[25]:
```
img=cv2.imread('saltandpep.jpg',0)
x,y=img.shape
z=cv2.blur(img,(3,3))
z1=cv2.blur(img,(5,5))
equ=np.hstack((img,z))
plt.title('original/Averaging filter3X3')
plt.imshow(equ,'gray')
plt.show()
equ=np.hstack((img,z1))
plt.title('original/averging filter 5X5')
plt.imshow(equ,'gray')
plt.show()
```





[26]:
```
z=cv2.medianBlur(img,5)
equ=np.hstack((img,z))
plt.title('original/Median Blur')
plt.imshow(equ,'gray')
```

```
plt.show()
```



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