pa1

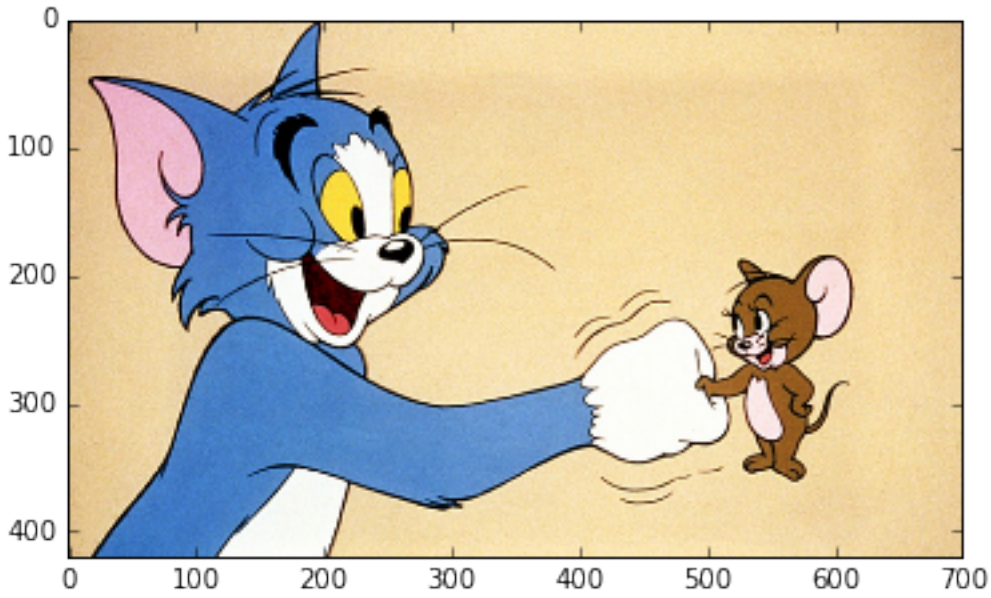
August 30, 2016

In [631]:
```
%matplotlib inline
from pylab import *
import matplotlib
import matplotlib.pyplot as plt
import numpy as np
import cv2
import matplotlib.image as mpimg
from pylab import *
```

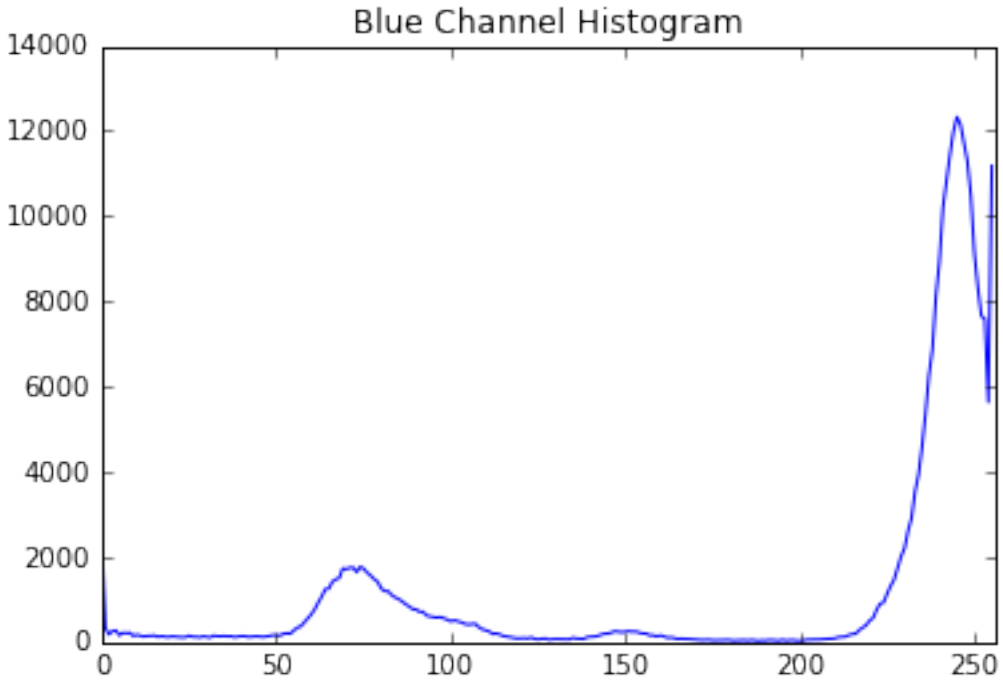
In [ ]:
```
```

In [632]:
```
y = x ** 2
img=mpimg.imread('tom.jpg')
img_p = cv2.imread('tom.jpg')
plt.imshow(img)
```

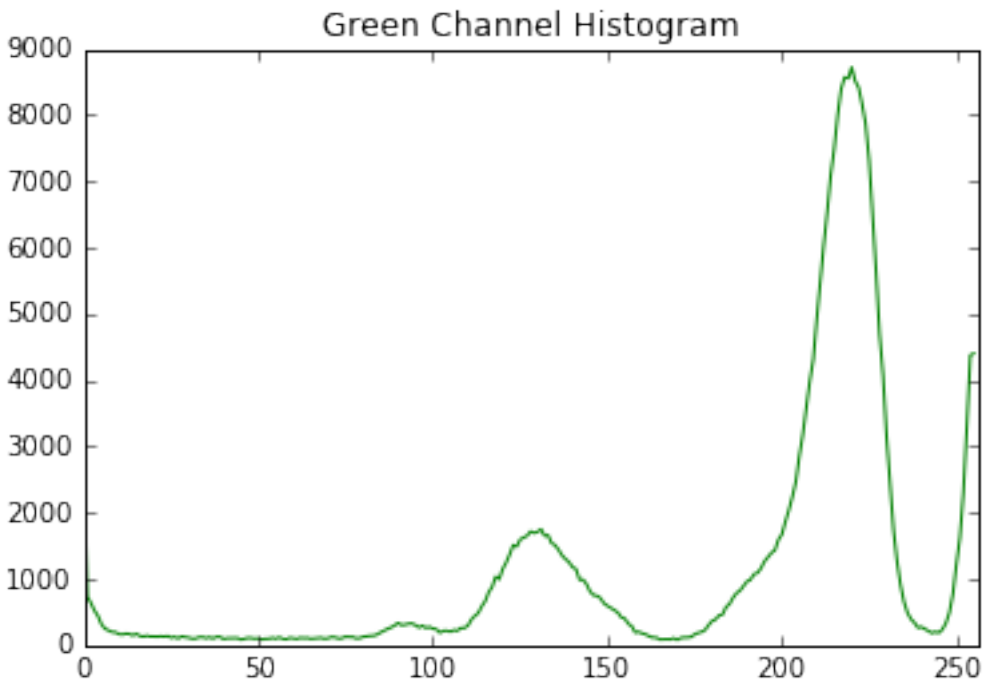
Out[632]: <matplotlib.image.AxesImage at 0x11fea66a0>



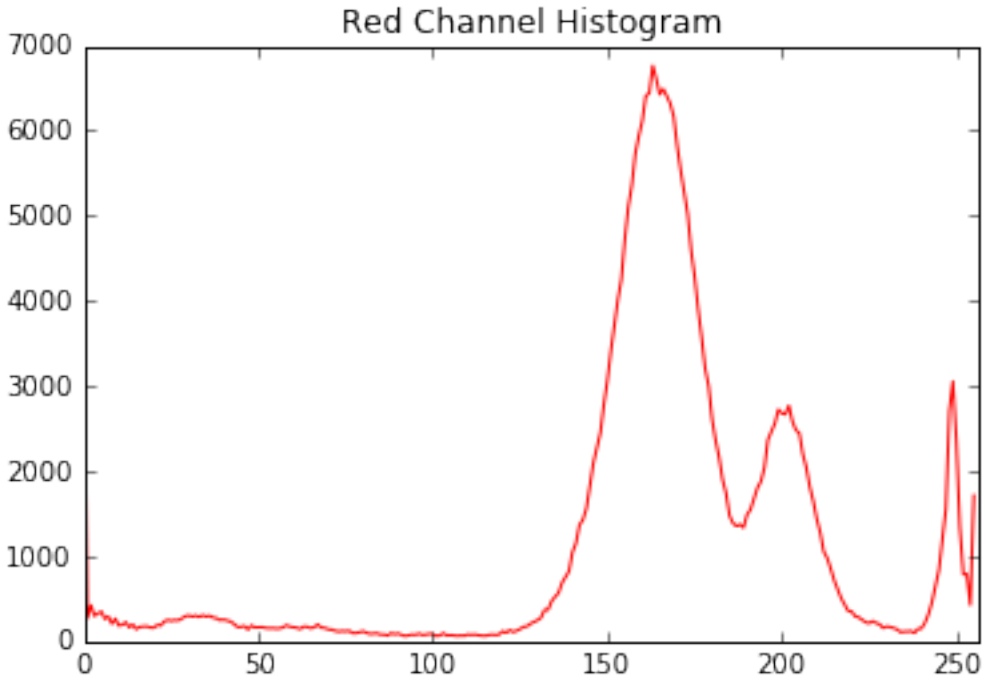
```
In [633]: histr = cv2.calcHist([img],[0],None,[256],[0,256])
          plt.plot(histr,color = 'b')
          plt.xlim([0,256])
          title('Blue Channel Histogram')
          plt.show()
```



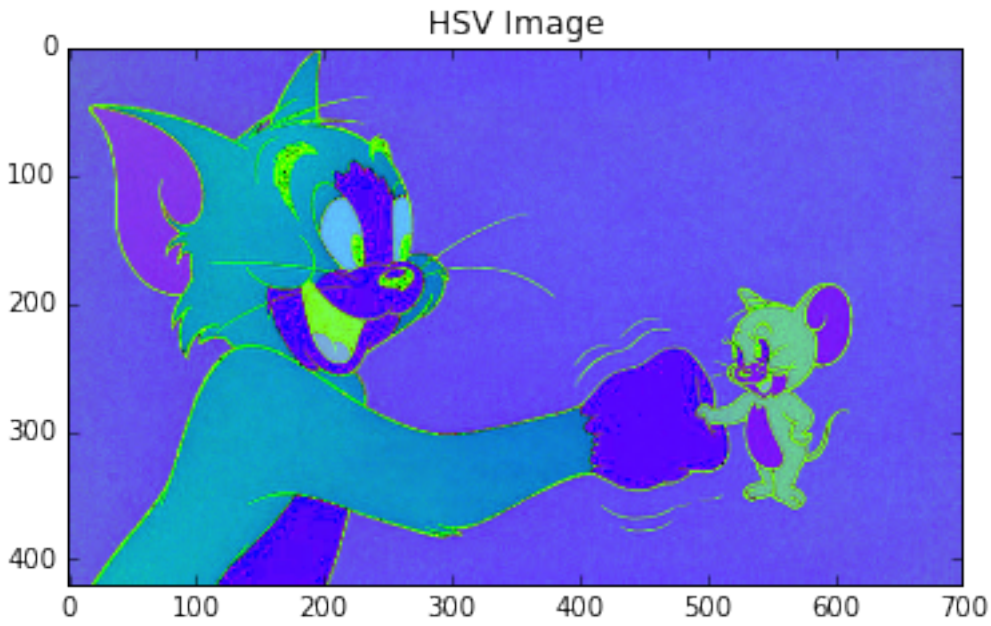

```
In [634]: histr = cv2.calcHist([img],[1],None,[256],[0,256])
          plt.plot(histr,color = 'g')
          plt.xlim([0,256])
          title('Green Channel Histogram')
          plt.show()
```



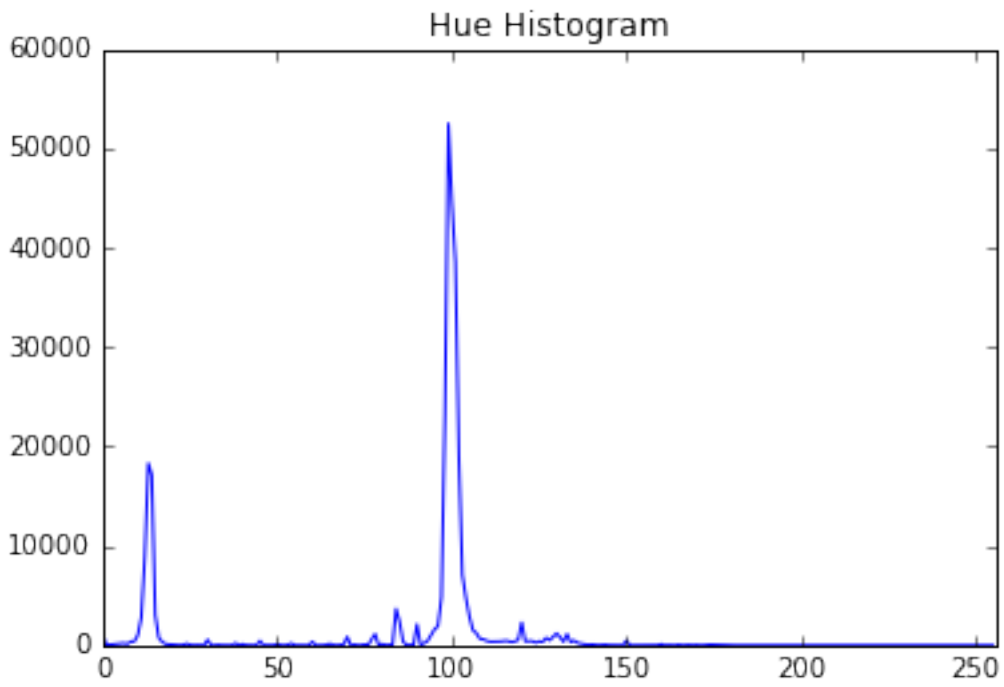

```
In [635]: histr = cv2.calcHist([img],[2],None,[256],[0,256])
          plt.plot(histr,color = 'r')
          plt.xlim([0,256])
          title('Red Channel Histogram')
          plt.show()
```



```
In [636]: hsv= cv2.cvtColor(img,cv2.COLOR_BGR2HSV)

In [637]: title('HSV Image')
          imgplot = plt.imshow(hsv)
```

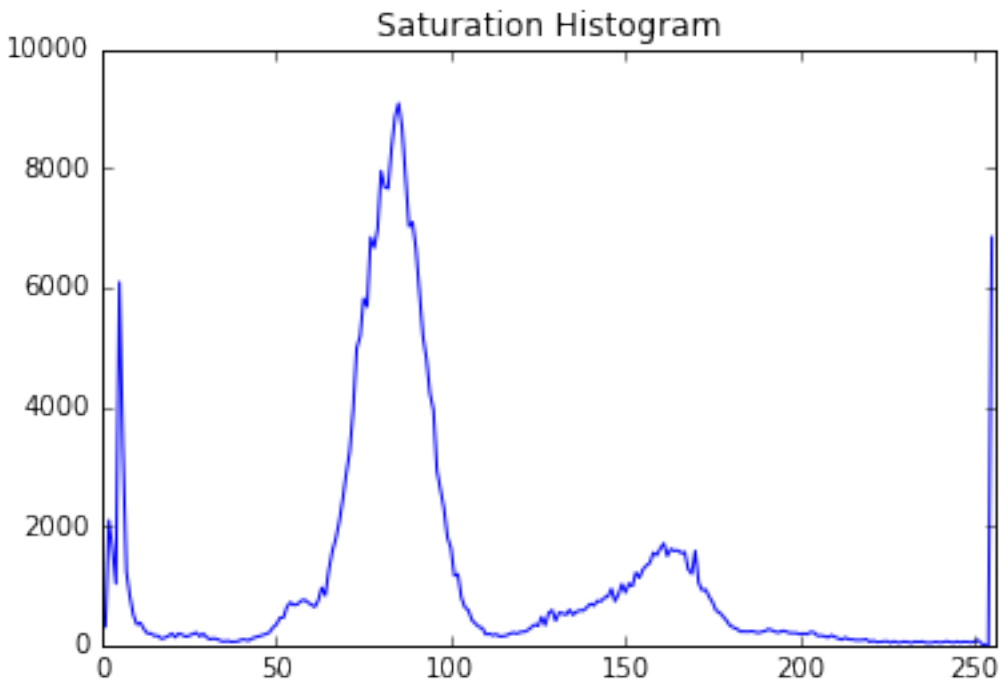



```
In [638]: histr = cv2.calcHist([hsv],[0],None,[256],[0,256])
          plt.plot(histr)
          plt.xlim([0,256])
          title('Hue Histogram')
          plt.show()
```

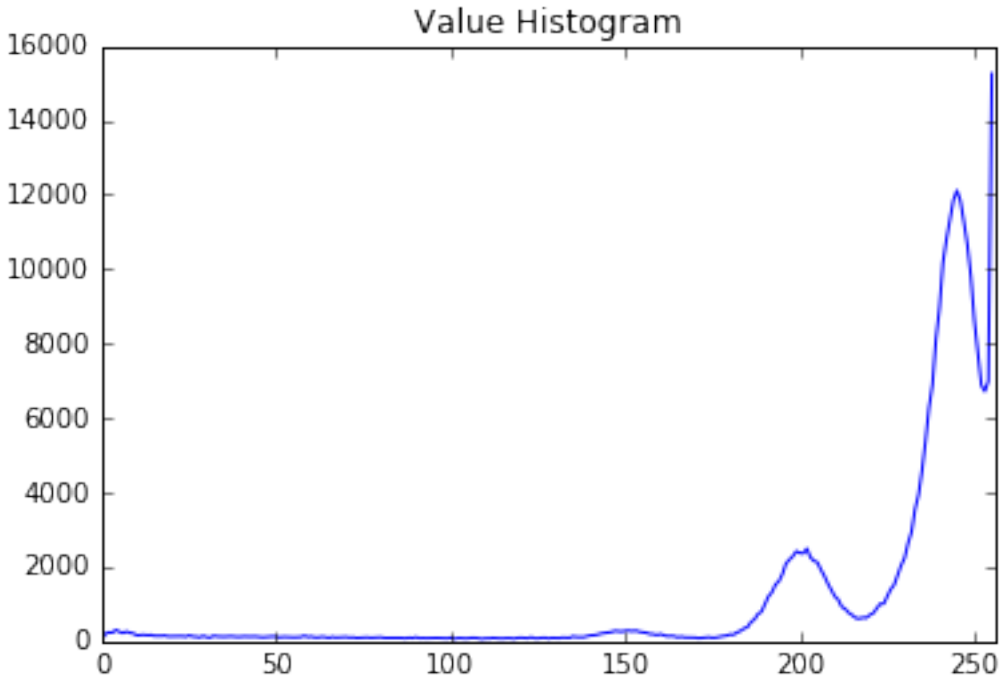


In [ ]:

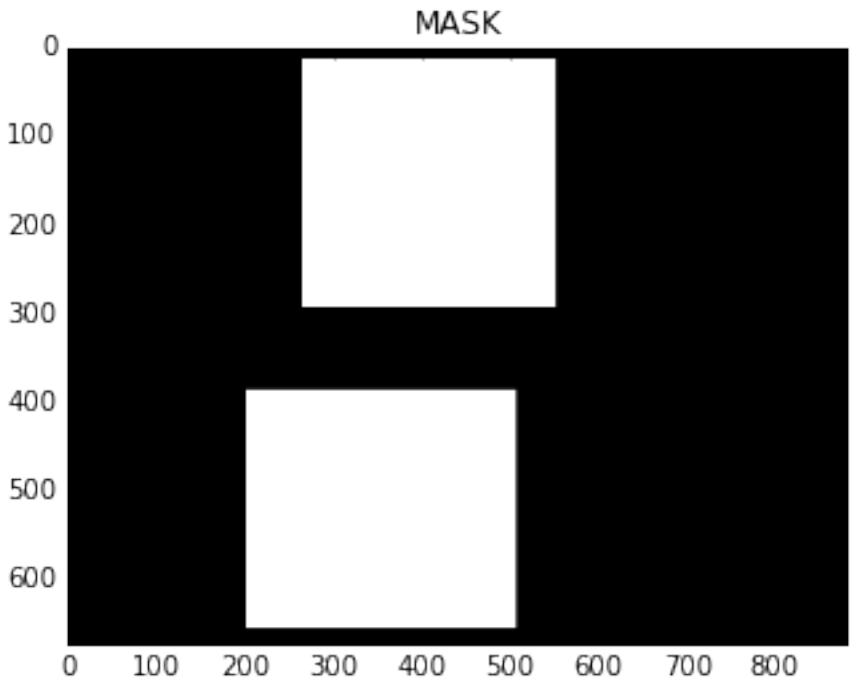
```
In [639]: histr = cv2.calcHist([hsv],[1],None,[256],[0,256])
          plt.plot(histr)
          plt.xlim([0,256])
          title('Saturation Histogram')
          plt.show()
```

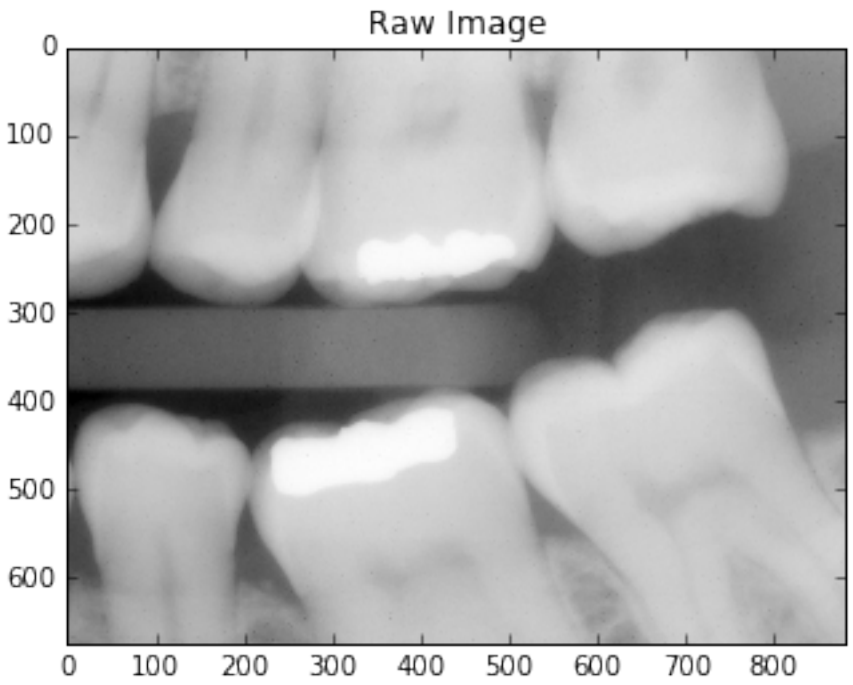


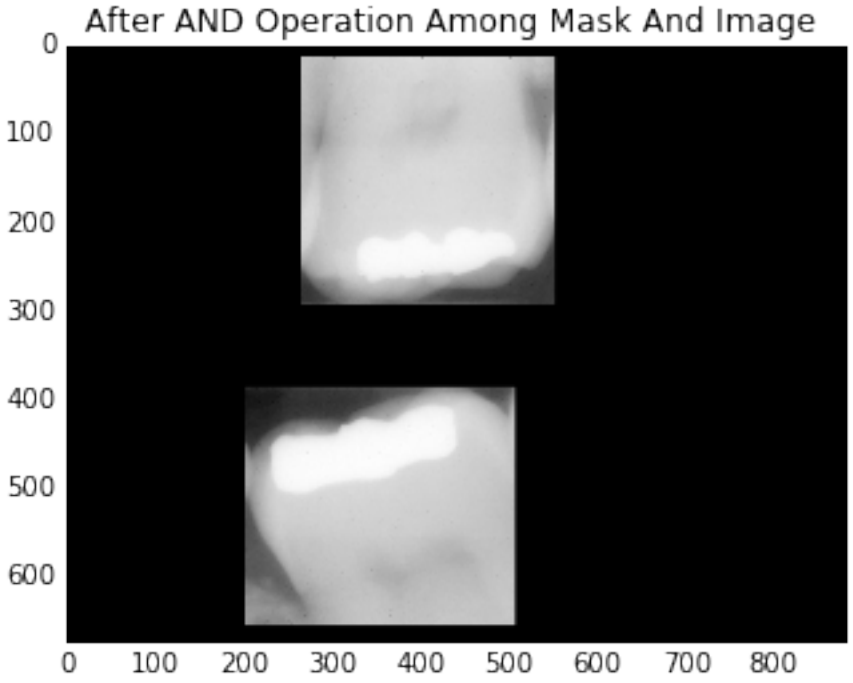

```
In [640]: histr = cv2.calcHist([hsv],[2],None,[256],[0,256])
          plt.plot(histr)
          plt.xlim([0,256])
          title('Value Histogram')
          plt.show()
```



```
In [641]: cv2.imread('Fig0228(b).tif',cv2.IMREAD_GRAYSCALE).shape

Out[641]: (420, 420)

In [642]: mask=cv2.imread('Fig0230(b).tif')
          figure()
          plt.imshow(mask)
          title('MASK')
          show()
          image=cv2.imread('Fig0230(a).tif')
          figure()
          plt.imshow(image)
          title('Raw Image')
          show()
          cv2.bitwise_and(image,mask,res)
          figure()
          title('After AND Operation Among Mask And Image ')
          plt.imshow(res)
          show()
```

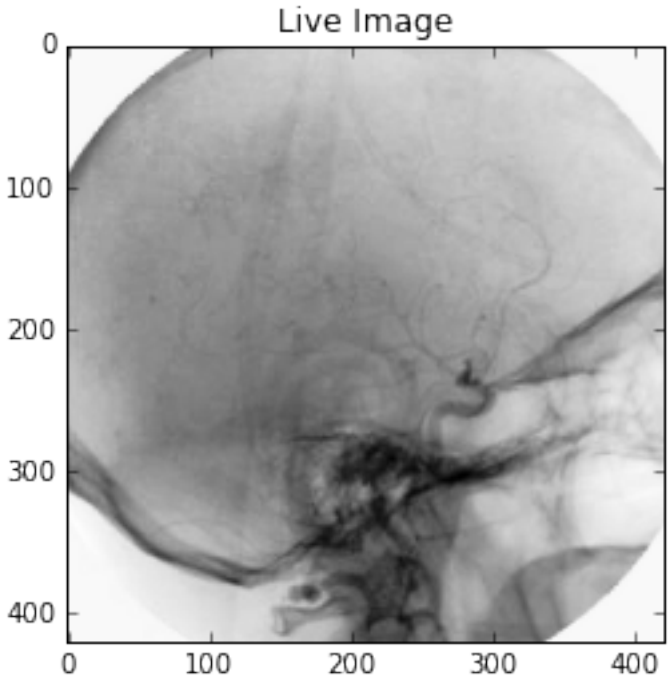


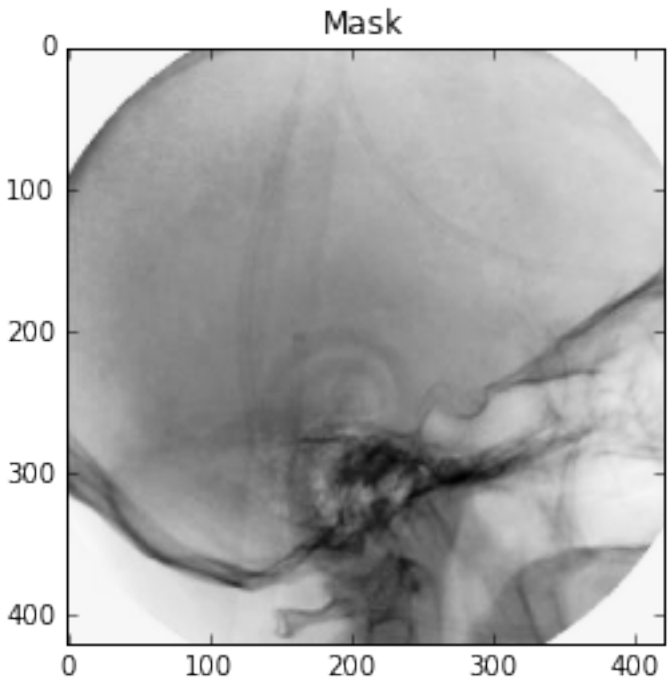


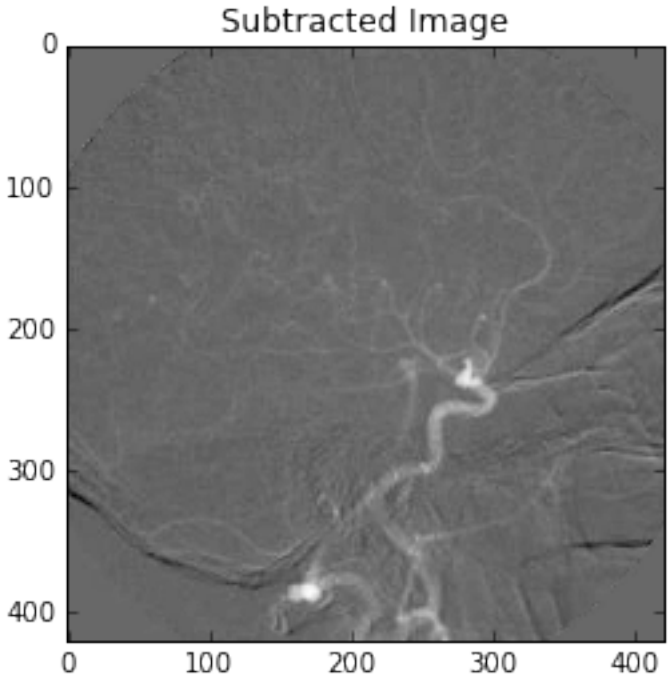



```
In [643]: b=cv2.imread('Fig0228(b).tif',0)
```

```
figure()
plt.imshow(b,cmap='Greys_r')
title('Live Image')
show()
a=cv2.imread('Fig0228(a).tif',0)
figure()
plt.imshow(a,cmap='Greys_r')
title('Mask')
show()

c=cv2.subtract(a,b,mask=a,dtype=1)
figure()
plt.imshow(c,cmap='Greys_r')
title('Subtracted Image')
show()
```



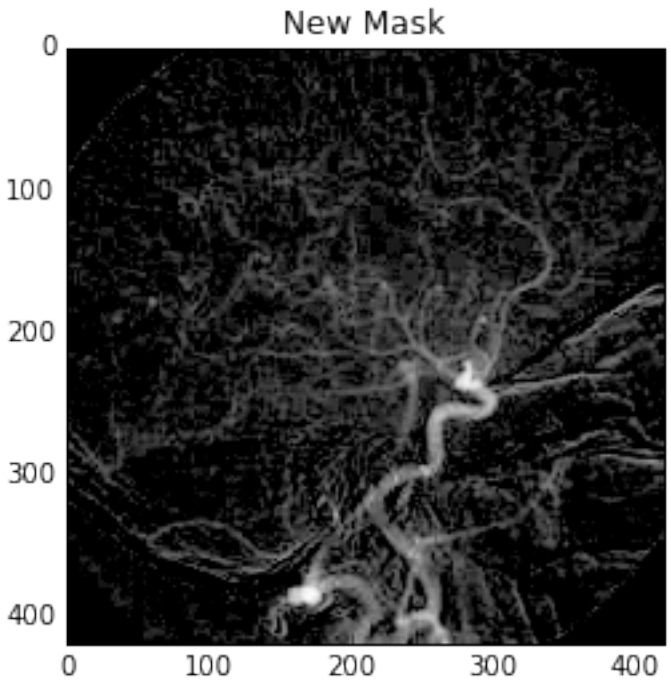


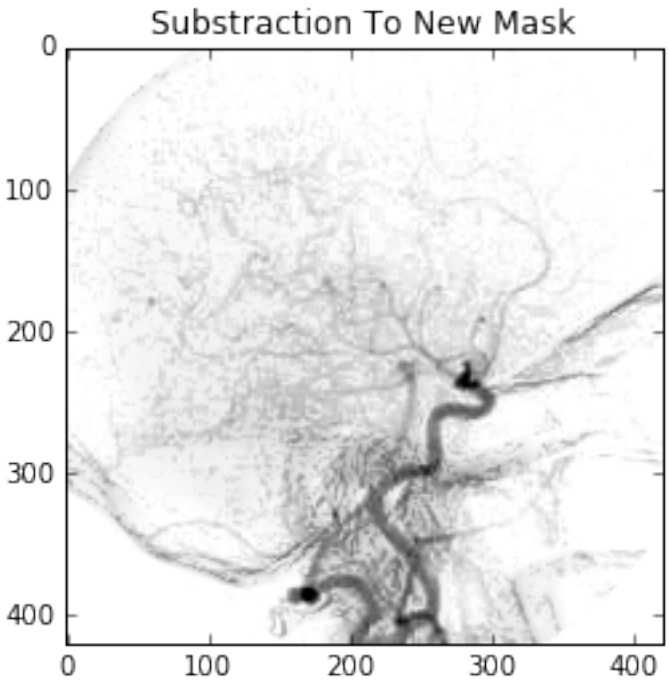


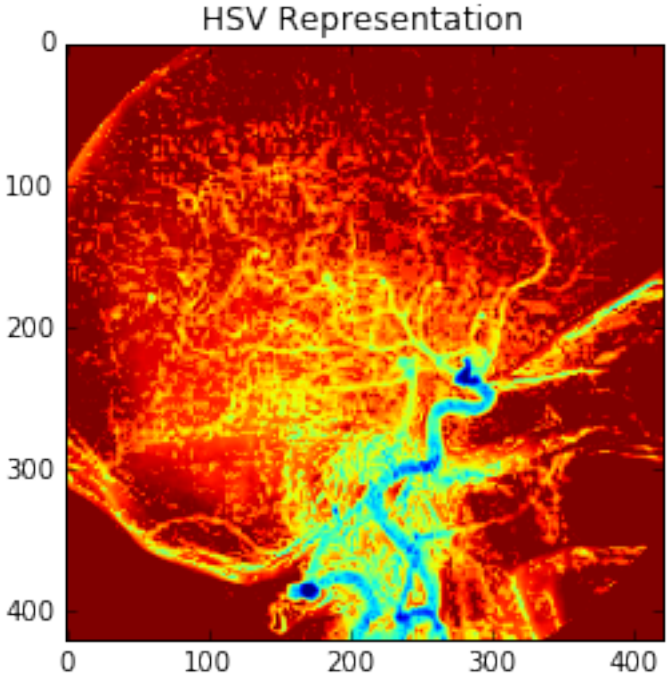

```
In [644]: # Increase intensity such that
          # dark pixels become much brighter,
```

```
# bright pixels become slightly bright

maxIntensity = 255.0 # depends on dtype of image data
x = arange(maxIntensity)
phi = 0.8 #i have played with these numbers to get result im expecting
theta = 1 #
newImage0 = (maxIntensity/phi)*(c/(maxIntensity/theta))**0.5
newImage0 = array(newImage0,dtype=uint8)
figure()
plt.imshow(newImage0,cmap='Greys_r')
title('New Mask')
show()

c=cv2.subtract(b,newImage0,dtype=1)
figure()
plt.imshow(c,cmap='Greys_r')
title('Substraction To New Mask')
show()

figure()
plt.imshow(c)
title('HSV Representation')
show()
```

```
/Users/nimaaghli/anaconda/lib/python3.5/site-packages/ipykernel/__main__.py:10: Run
```




Substraction To New Mask
0
100
200
300
400
0
100
200
300
400


HSV Representation
0
100
200
300
400
0
100
200
300
400

In [ ]:

In [ ]:

In [ ]: