Asad Haroon

SP17-BCS-012

Geometric Mean Filter

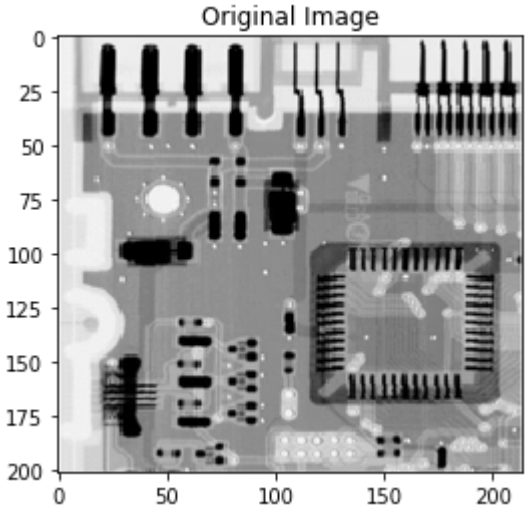
Import Libraries

In [1]:
```
import cv2
from scipy.misc import imread
import matplotlib.pyplot as plt
import numpy as np
from skimage.util import random_noise
from skimage.filters import rank
```

Read Image

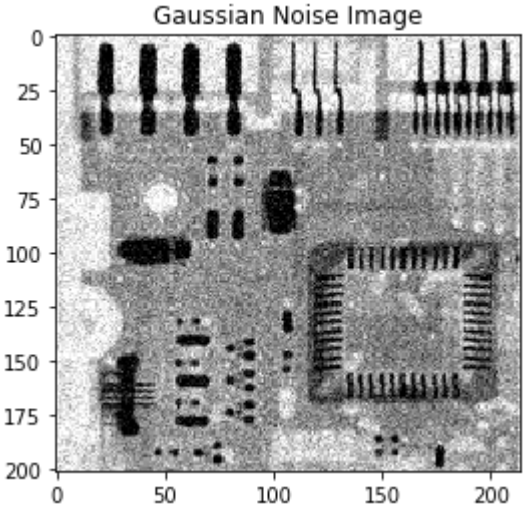
In [2]:
```
img=imread("circuit_image.png",False,'L')
img=img.astype(np.uint8)
img_2=img.copy()
plt.title("Original Image")
plt.imshow(img,plt.cm.gray)
plt.show()
```

```
C:\ProgramData\Anaconda3\lib\site-packages\ipykernel_launcher.py:1: DeprecationWarning: `imread` is deprecate
d!
`imread` is deprecated in SciPy 1.0.0, and will be removed in 1.2.0.
Use ``imageio.imread`` instead.
  """Entry point for launching an IPython kernel.
```



Adding Gaussian Noise

In [3]:
```
rows, cols = img.shape[:2]
noise_img = random_noise(img_2, mode='gaussian')
noise_image=noise_img*255
img_2=noise_image
plt.title("Gaussian Noise Image")
plt.imshow(noise_image,plt.cm.gray)
plt.show()
```



In [4]:
```
img_geo=np.zeros((rows,cols))
for i in range(1,rows-1):
    for j in range(1,cols-1):
        ans=img_2[i-1:i+2,j-1:j+2]
        ans=np.prod(ans)
        ans=round(pow(ans,1/9))
        img_geo[i,j]=ans
print(img_geo[1:5,1:5])
```

```
[[245. 239. 234. 227.]
 [242. 238. 232. 227.]
 [239. 236. 241. 241.]
 [237. 231. 237. 238.]]
```

In [5]:
```
plt.imshow(img_geo,plt.cm.gray)
```

Out[5]:
```
<matplotlib.image.AxesImage at 0x21e20bdbc48>
```