

Extra 1

Ajouter bruit puis filtrer

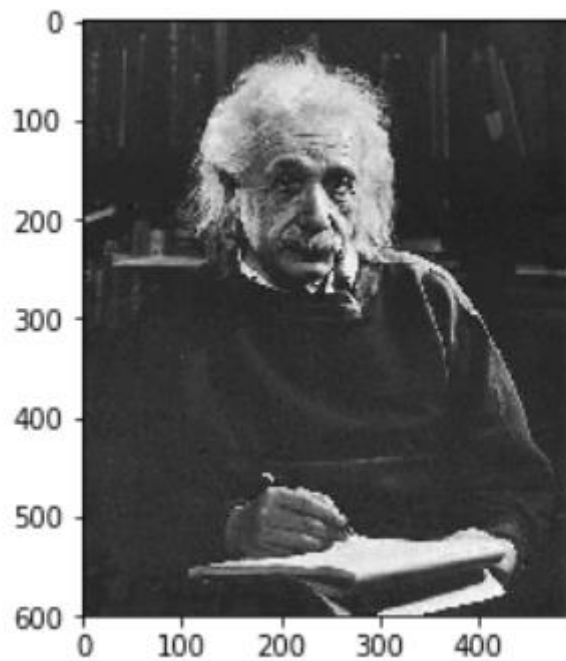
```
Entrée [29]: Fsize=3
sigma=1
import random
def sp_noise(image,prob):
    '''
    Add salt pepper noise
    PROB: Noise ratio
    '''
    output = np.zeros(image.shape,np.uint8)
    thres = 1 - prob
    for i in range(image.shape[0]):
        for j in range(image.shape[1]):
            rdn = random.random()
            if rdn < prob:
                output[i][j] = 0
            elif rdn > thres:
                output[i][j] = 255
            else:
                output[i][j] = image[i][j]
    return output

def gasuss_noise(image, mean=0, var=0.001):
    '''
    Add Gaussian noise
    Mean: mean
    Var: Variance
    '''
    image = np.array(image/255, dtype=float)
    noise = np.random.normal(mean, var ** 0.5, image.shape)
    out = image + noise
    out = np.uint8(out*255)
    #cv.imshow("gasuss", out)
    return out
```

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Entrée [30]: image =cv.imread('image.tif',0)
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Entrée [31]: plt.imshow(image,cmap='gray')
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Out[31]: <matplotlib.image.AxesImage at 0x181419f56a0>
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Entrée [32]: image2=sp_noise(image,0.01)
             image3=gasuss_noise(image)
             plt.figure(figsize=(12,8))
             plt.subplot(131)
             plt.imshow(image,cmap='gray')
             plt.title('Original')
             plt.subplot(132)
             plt.imshow(image2,cmap='gray')
             plt.title('Salt and peper noise')
             plt.subplot(133)
             plt.imshow(image3,cmap='gray')
             plt.title('Gaussian noise')
```

```
Out[32]: Text(0.5, 1.0, 'Gaussian noise')
```

