CSE 4630
Pattern Recognition Lab

Lab-01

Image handling and noise

- Create a ipynb file in your google colab
- Name it as PR_Lab_01

Step1: Load the Dependencies

> This section loads some required libraries used in this notebook: **numpy**, **pandas**, **cv2**, **skimage**, **PIL**, **matplotlib**

- Numpy is an array manipulation library, used for linear algebra, Fourier transform, and random number capabilities.
- Pandas is a library for data manipulation and data analysis.
- CV2 is a library for computer vision tasks.
- Skimage is a library which supports image processing applications on python.
- Matplotlib is a library which generates figures and provides graphical user interface toolkit.

```
import numpy as np
import pandas as pd
import cv2 as cv
from google.colab.patches import cv2_imshow # for image display

from skimage import io
from PIL import Image
import matplotlib.pylab as plt
```

```
from google.colab import drive

# This will prompt for authorization.
drive.mount('/content/drive')
```

```
Drive already mounted at /content/drive; to attempt to forcibly remount, call
drive.mount("/content/drive", force_remount=True).
```

```
[ ]  image = cv.imread("/content/drive/My Drive/colab/cat.jpeg", 0)
```

```
[ ]  image = io.imread("https://placekitten.com/800/571")
```

```
[ ]  cv2_imshow(image)
```

```
[ ]  print(image.shape)
     print(image.dtype)
     print(image.size)
```

```
(571, 800)
uint8
456800
```

```
[ ]  print(image.shape[2])
```

```
3
```

```
[ ]  nimage = image.copy()
     add_noise(nimage)
     cv2_imshow(image)
     cv2_imshow(nimage)
```

```python
import random

def add_noise(img):

    # Getting the dimensions of the image
    row , col = img.shape
    number_of_pixels = random.randint(300, 10000)
    for i in range(number_of_pixels):

        # Pick a random y coordinate
        y_coord=random.randint(0, row - 1)

        # Pick a random x coordinate
        x_coord=random.randint(0, col - 1)

        # Color that pixel to white
        img[y_coord][x_coord] = 255
```

```
    # Randomly pick some pixels in
    # the image for coloring them black
    # Pick a random number between 300 and 10000
    number_of_pixels = random.randint(300 , 10000)
    for i in range(number_of_pixels):

        # Pick a random y coordinate
        y_coord=random.randint(0, row - 1)

        # Pick a random x coordinate
        x_coord=random.randint(0, col - 1)

        # Color that pixel to black
        img[y_coord][x_coord] = 0

    return img
```

```
nimage = image.copy()
add_noise(nimage)
cv2_imshow(image)
cv2_imshow(nimage)
```

```
image = cv.imread("/content/drive/My Drive/colab/cat.jpeg", 1)
cv2_imshow(image)
```

```
gauss = np.random.normal(0,1,image.size)
gauss = gauss.reshape(image.shape[0],image.shape[1], image.shape[2]).astype('uint8')
# Add the Gaussian noise to the image
img_gauss = cv.add(image,gauss)
# Display the image
cv2_imshow(img_gauss)
```

```
image.size
```

```
1370400
```

```
gauss = np.random.normal(0,1,image.size)
gauss = gauss.reshape(image.shape[0],image.shape[1],image.shape[2]).astype('uint8')
noise = image + image * gauss

cv2_imshow(noise)
```