INT3404E 20 - Image Processing: Homeworks 1

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1 Exercise 1: Basic python

- Done

2 Exercise 2: Google Colaboratory

Google Colab: **Colab** or **Github HW1**

3 OpenCV, Numpy, Matplotlib, and Latex

A picture or image can be represented as a NumPy array of "pixels", with dimensions H × W × C, where H is the height, W is the width, and C is the number of color channels. Figure 1 illustrates the coordinate system. The origin is at the top left corner and the first dimension indicates the Y (row) direction, while the second dimension indicates the X (column) dimension. Typically we will use an image with channels that give the Red, Green, and Blue "level" of each pixel, which is referred to in the short form RGB. The value for each channel ranges from 0 (darkest) to 255 (lightest). However, when loading an image through Matplotlib, this range will be scaled from 0 (darkest) to 1 (brightest) instead, and will be a real number, rather than an integer.

You will write Python code to load an image perform several manipulations to the image and visualize their effects. You'll need to get the file uet.png from the same place you downloaded this assignment.

- Implement all functions in the file ex1.py: Done **Github/HW1**

- Report the result of the functions flip image, rotate image, grayscale image:

    – Original image:

Figure 1: Original Image

– Flip image:

Figure 2: Flipped Image

– Rotate image:

Figure 3: Rotated Image

– Grayscale image:

Figure 4: Gray Image

- Create a public repository on Github: **Github**