INT3404E - Image Processing: HW 1

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1 Homework

Figure 1: Original images

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.
Report the result of the functions flip_image, rotate_image, grayscale_image.

2 Report of results

The result of Gray-scale Image, Flipped Gray-scale Image, Rotated Gray-scale Image.

Figure 2: Gray-scale Image

Figure 3: Flipped Gray-scale Image

Figure 4: Rotated Gray-scale Image.