

HW 1: Basic Image Manipulation

Source Code

All questions are written in Python code, please refer to the file “main.py”.

All images will be stored in the folder “res” (automatically create a new folder).

In accordance with the **FAQ** of course website:

- Part 1 does not use any library function, except Numpy (for organizing purposes).
- Part 2 uses other library functions as **there are no restrictions**.

Part 1

1. Upside Down

Algorithm:

- 1) Read from the bottom-right corner of the original image
- 2) Store in a list
- 3) Convert list to numpy array
- 4) Reshape to original size



2. Right-side Left

Algorithm:

- 1) Read original image from the right
- 2) Store in a list
- 3) Convert list to numpy array
- 4) Reshape to original size



3. Diagonally Flip

Algorithm:

- 1) Read original image
- 2) Copy the values right-diagonal-half of the original image
- 3) Paste the values onto the left-diagonal-half of the original image



Part 2

4. Rotate 45 degrees clockwise

Algorithm:

- 1) Use `scipy.ndimage` to rotate image (`ndimage.rotate(img, -45)`)
- 2) Change values of 0 with 255 (black -> white)



5. Shrink image in half

Algorithm:

- 1) Use `cv2.resize` to resize image

```
(cv2.resize(img, (int(height/2), int(width/2)), cv2.INTER_AREA))
```

- 2) Insert size of half-sized image into the function



6. Binarize image

Algorithm: Use `cv2.threshold` to binarize image

```
(cv2.threshold(img, 128, 255, cv2.THRESH_BINARY))
```

