FALL 2025 EEP 596: Computer Vision
Homework 1 REPORT
Van Tha Bik Lian
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Notes for future reference

conda create -n eep596_cv python=3.10 numpy matplotlib opencv pytorch torchvision torchaudio cpuonly -c pytorch -c conda-forge

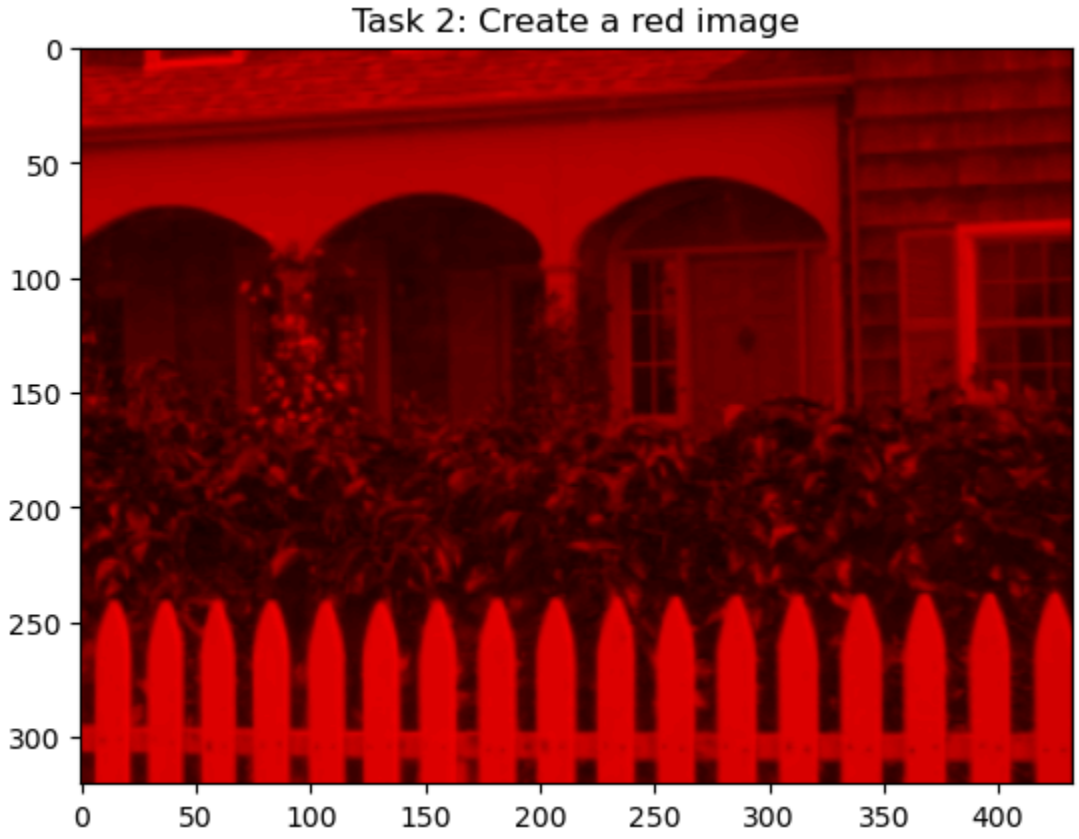
conda activate eep596_cv

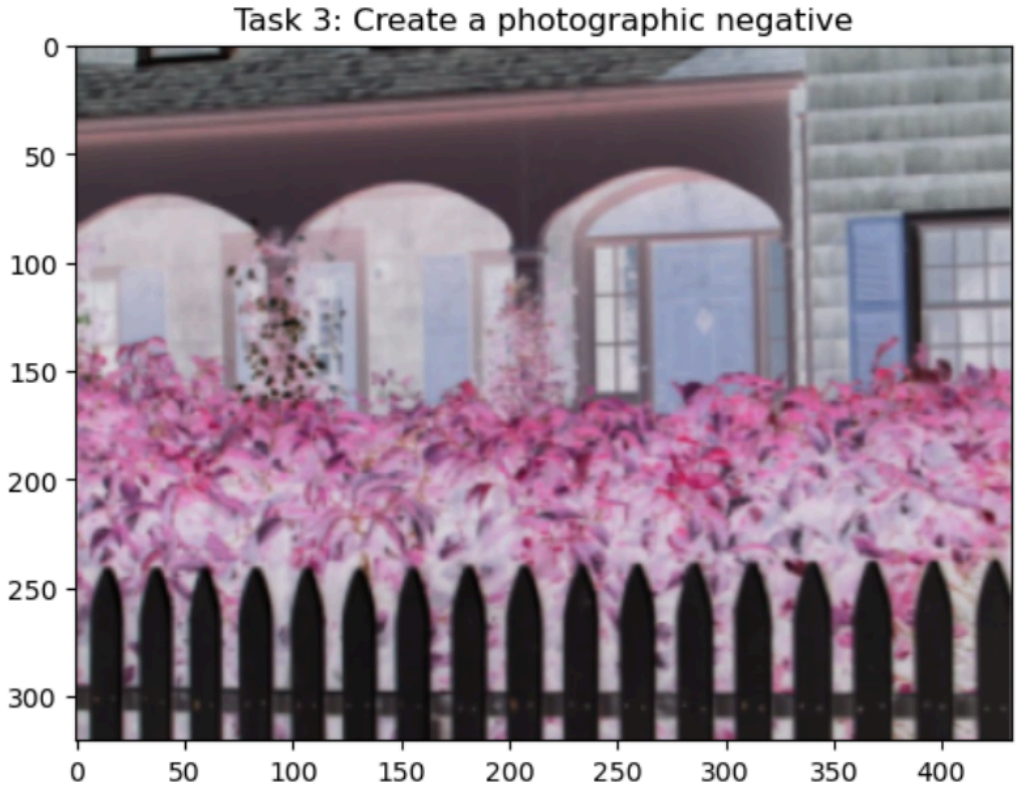
python -c "import numpy as np, matplotlib, cv2; print(np.__version__); print(matplotlib.__version__); print(cv2.__version__)"

For ipynb: conda install -n eep596_cv ipykernel --update-deps --force-reinstall

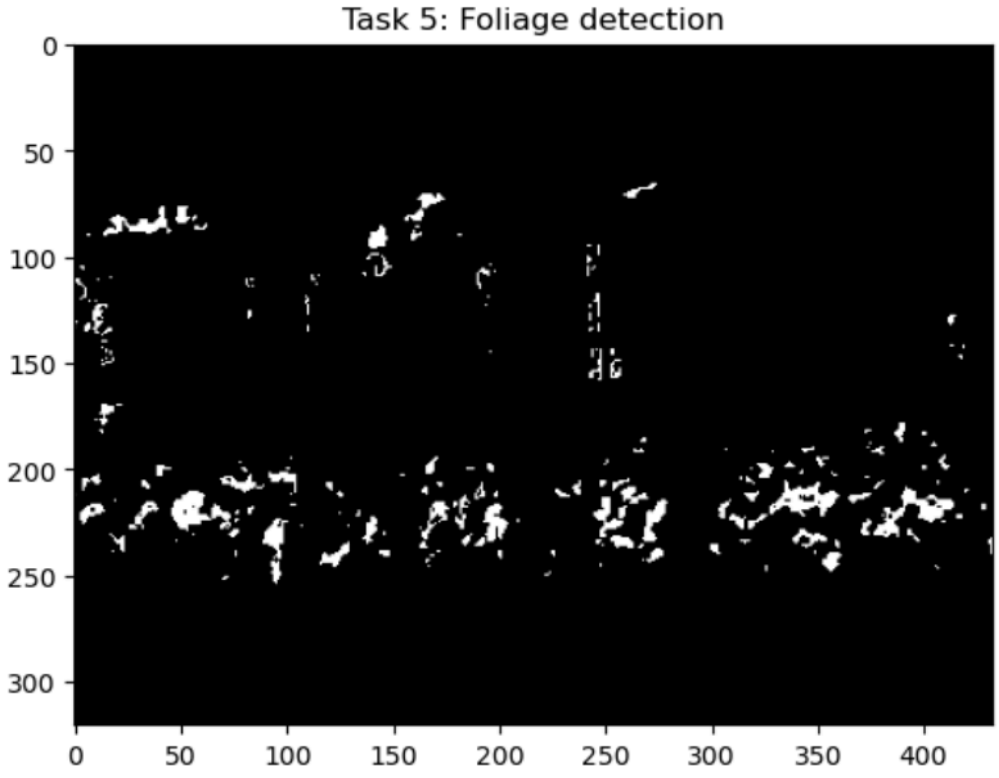
Geometric Transformations of Images:
https://docs.opencv.org/4.x/da/d6e/tutorial_py_geometric_transformations.html

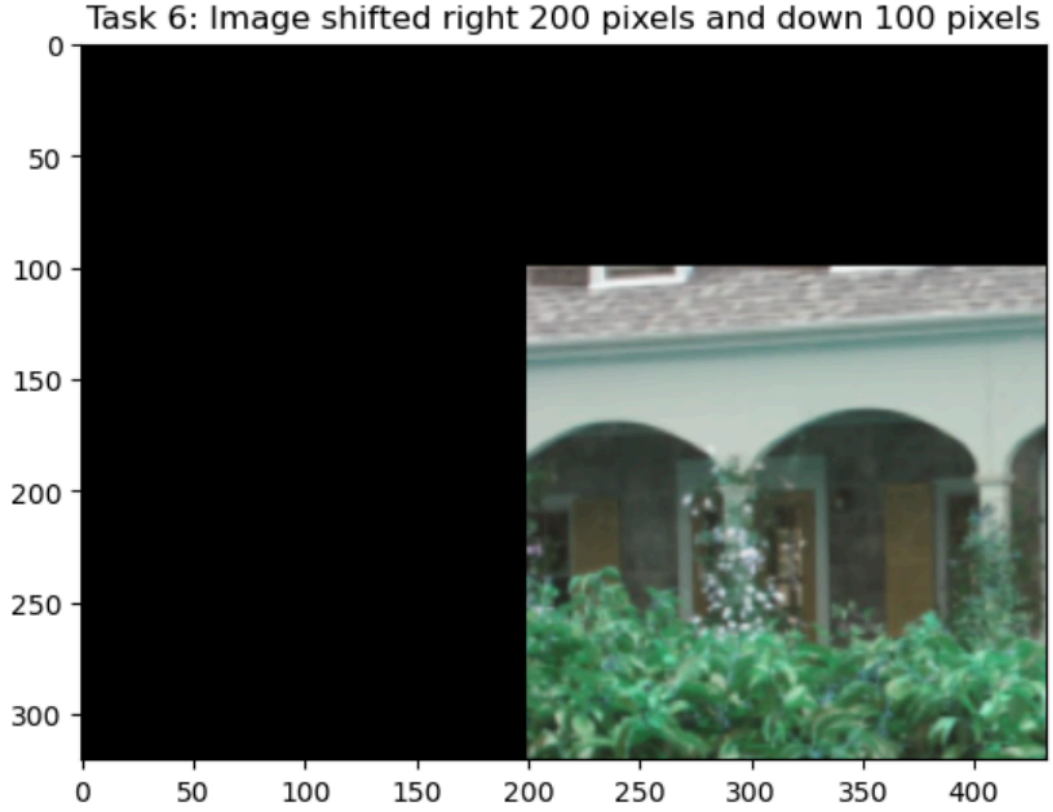
```
----- Task 1: Load and analyze the image ----
Image data type: BGR
Pixel data type: uint8
Image dimensions: (321, 433, 3)
----- Task 1: Load and analyze the image ----
```

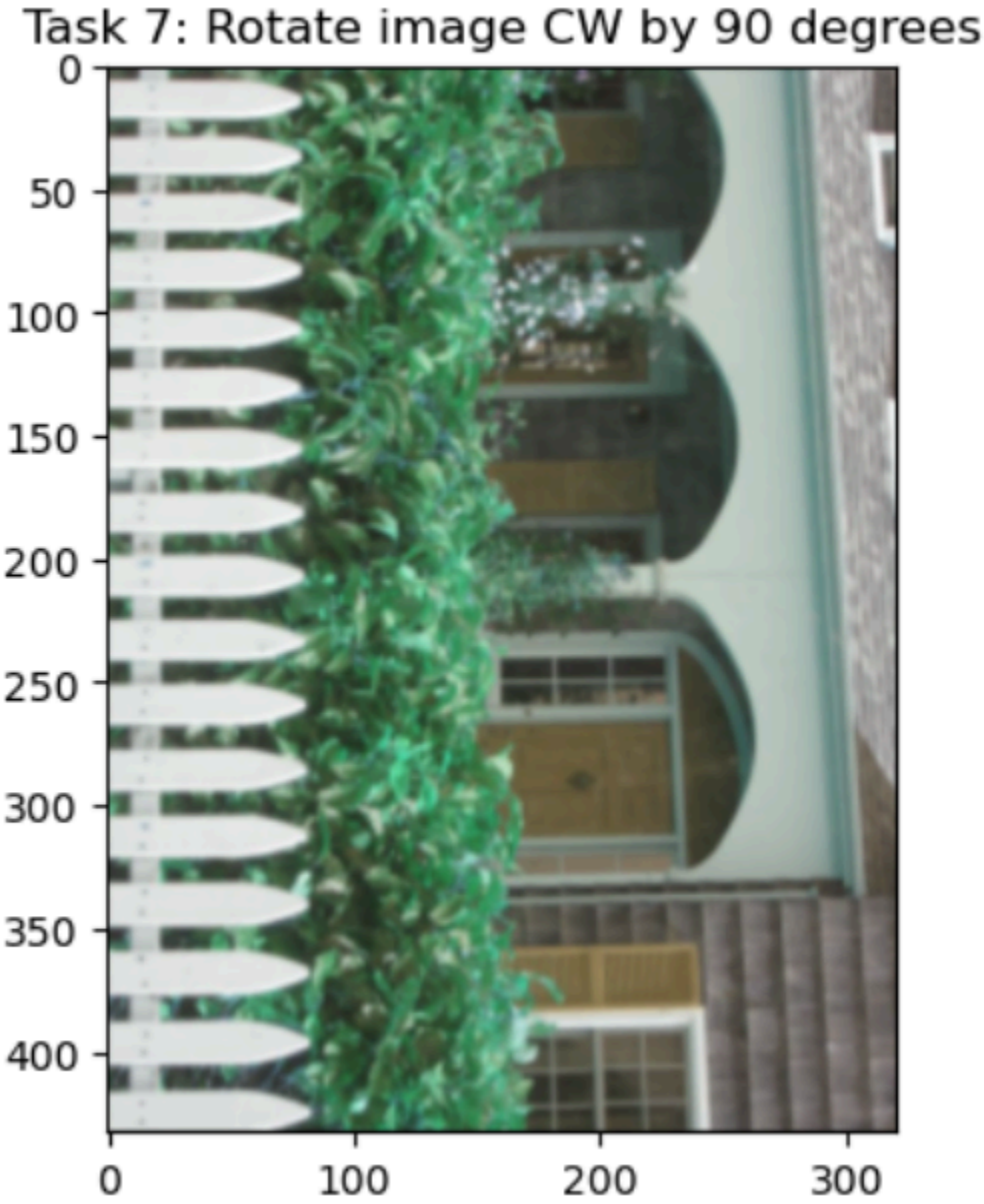


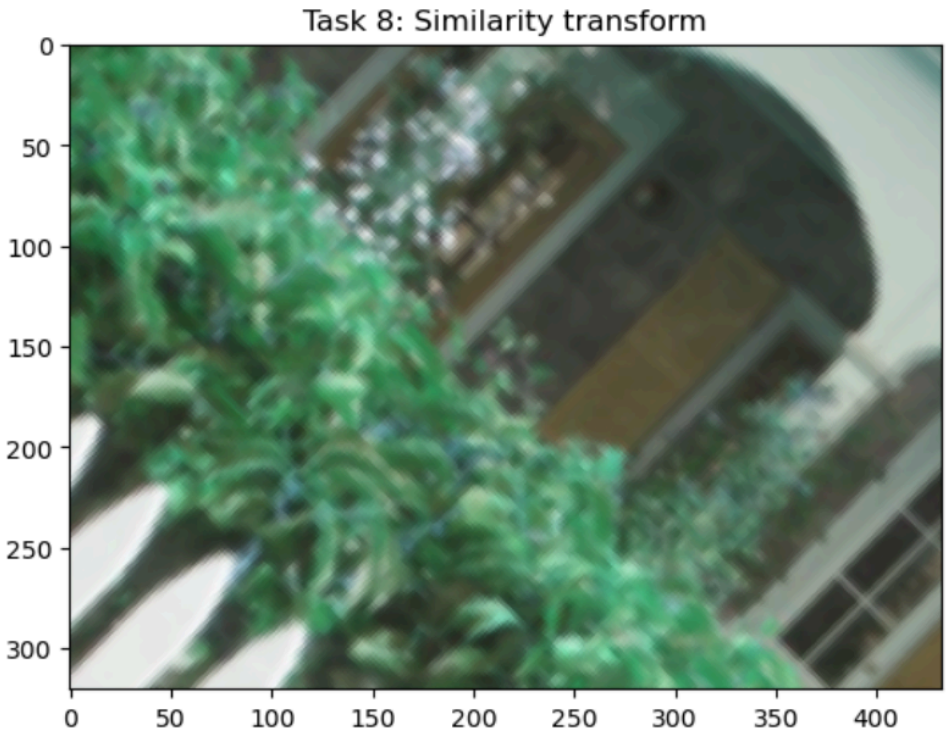

Task 3: Create a photographic negative
0
50
100
150
200
250
300
0
50
100
150
200
250
300
350
400

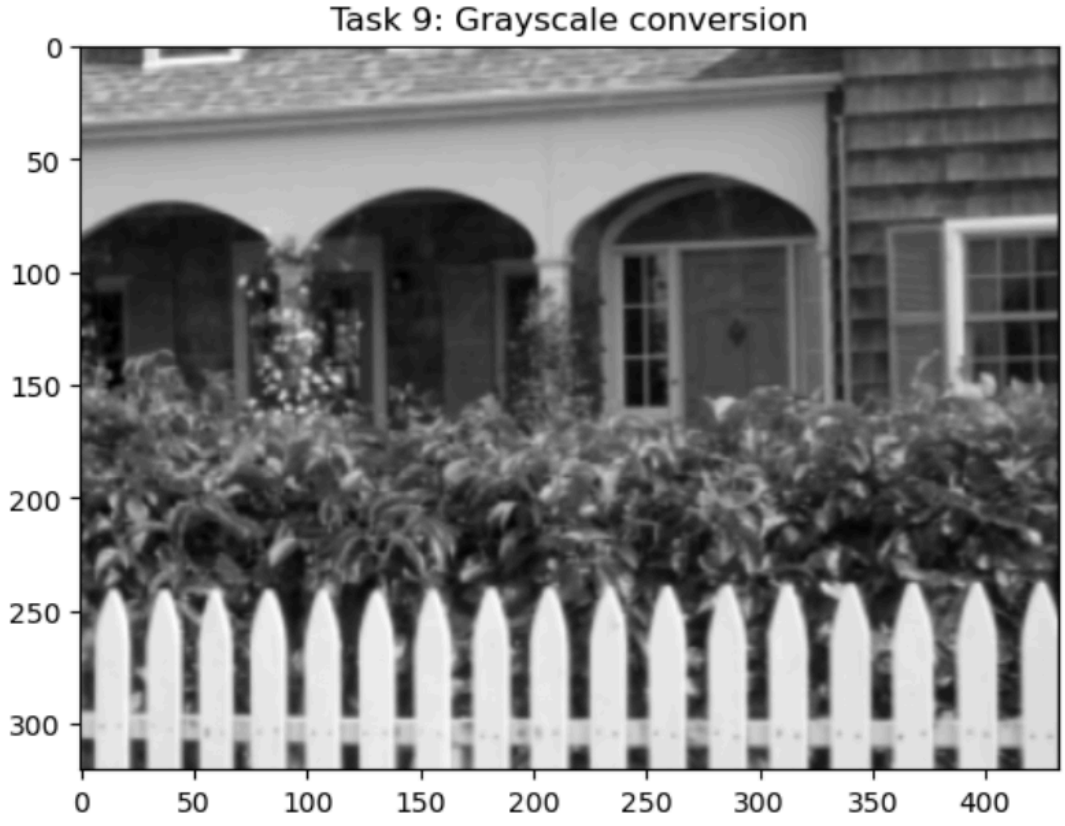

Task 4: Swap color channels
0
50
100
150
200
250
300
0
50
100
150
200
250
300
350
400


Task 5: Foliage detection
0
50
100
150
200
250
300
0
50
100
150
200
250
300
350
400


Task 6: Image shifted right 200 pixels and down 100 pixels
0
50
100
150
200
250
300
0
50
100
150
200
250
300
350
400


Task 7: Rotate image CW by 90 degrees
0
50
100
150
200
250
300
350
400
0
100
200
300


Task 8: Similarity transform
0
50
100
150
200
250
300
0
50
100
150
200
250
300
350
400


Task 9: Grayscale conversion
0
50
100
150
200
250
300
0
50
100
150
200
250
300
350
400

```
Task 10: Moments of a binary image
First-Order Moments:
Standard (Raw) Moments: M00 = 11792.0, M10 = 5617082.0, M01 = 2254903.0
Centralized Moments:
x_bar = 476.34684531886023, y_bar = 191.22311736770692
Second-Order Centralized Moments:
mu20 = 137886399.4026459, mu02 = 59351807.97820555, mu11 = 57699869.44996607
```