Advance Image Processing
Homework 6

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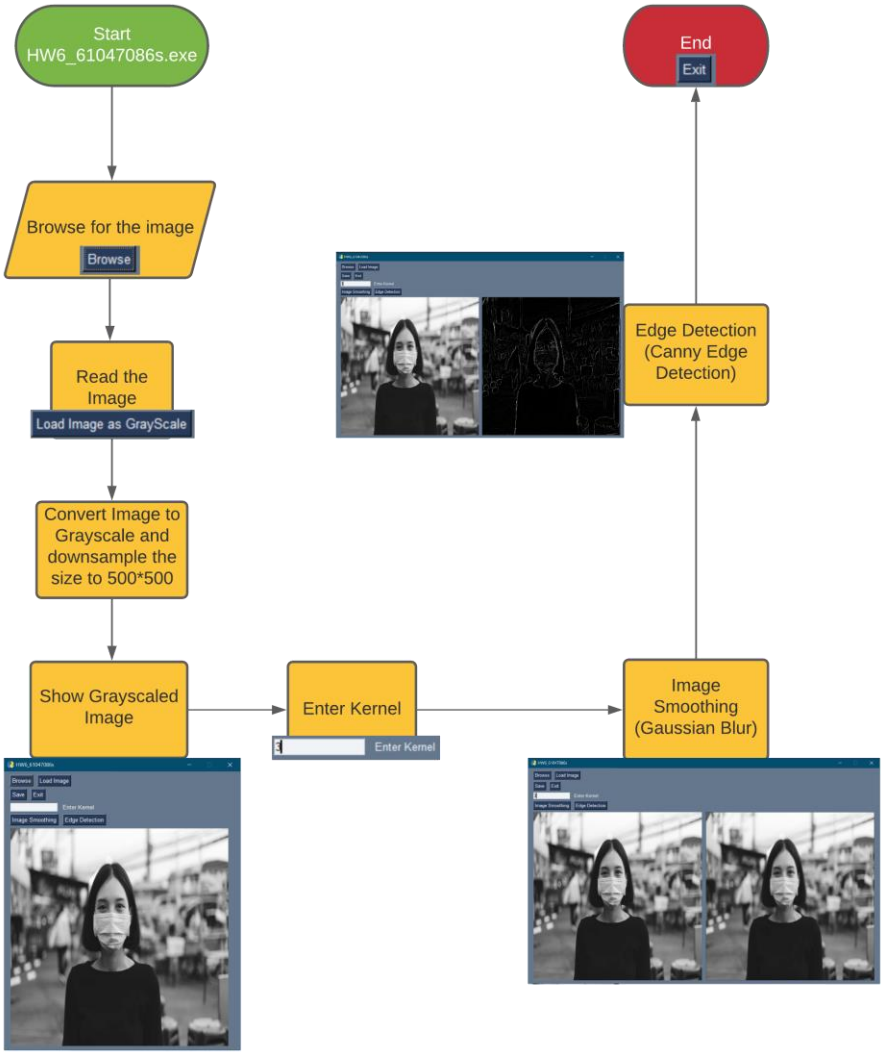
1. Project topic: Image smoothing and Edge Detection
2. Programming language and Compiler: Python 3.7.8
3. Library- OpenCV Latest, Numpy Latest, PySimpleGUI- Latest,
4. The main functions of the program:
   (a) Read image files: including JPG files, BMP files, PPM files and PNG files
   (b) Show Gaussian Blur from input kernel
   (c) Show Edge Detection(Canny Edge Detection)
5. The flowchart of the program:

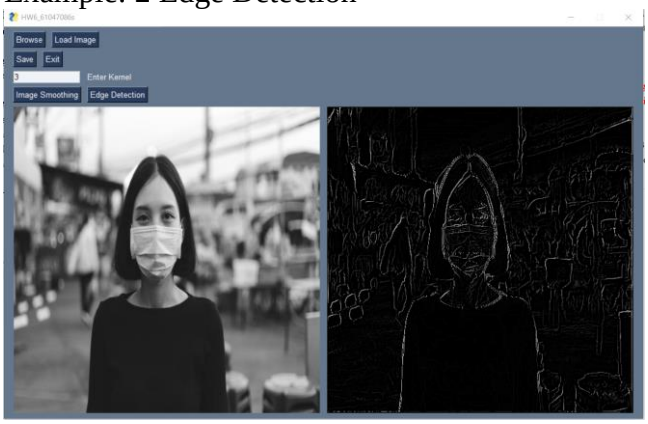


6. Testing results (4 examples)

Example: 1 Gaussian Blur

(Input Image) (Output Result)

Example: 2 Edge Detection

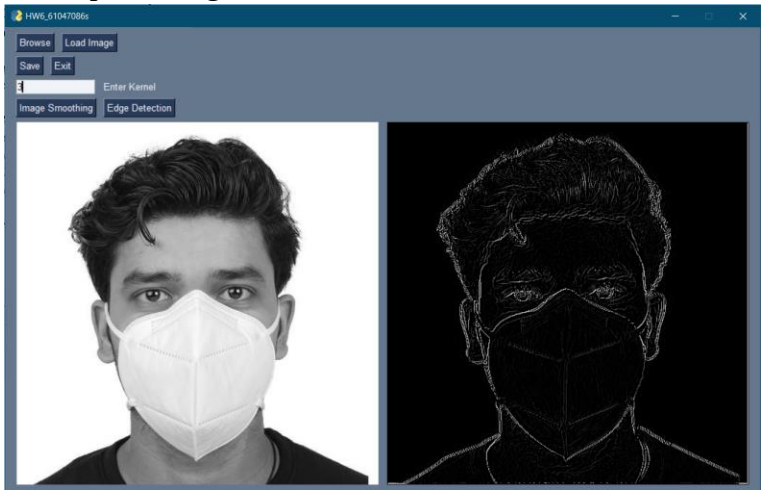


(Input Image) (Output Result)

Example: 3 Gaussian Blur

(Input Image) (Output Result)

Example: 4 Edge Detection



(Input Image) (Output Result)

7. What you have learned in this homework?

   This homework taught me many important things. Some of them are:

   - Gaussian blur using Kernel.
   - Convolution
   - Sobel Edge Detector
   - Non-max suppression
   - Thresholding
   - Hysteresis

   The challenges I faced the most was edge detection. I was good until sobel edge convolution. But after that non-max suppression was confusing because of implementing the values of radians. Threshold was easy and so was hysteresis but the theoretical is quite confusing in these two. I believe that further practice will further enhance my memory and the theory as well. I thank professor and TA for giving me the opportunity to learn this under their guidance and help respectively.