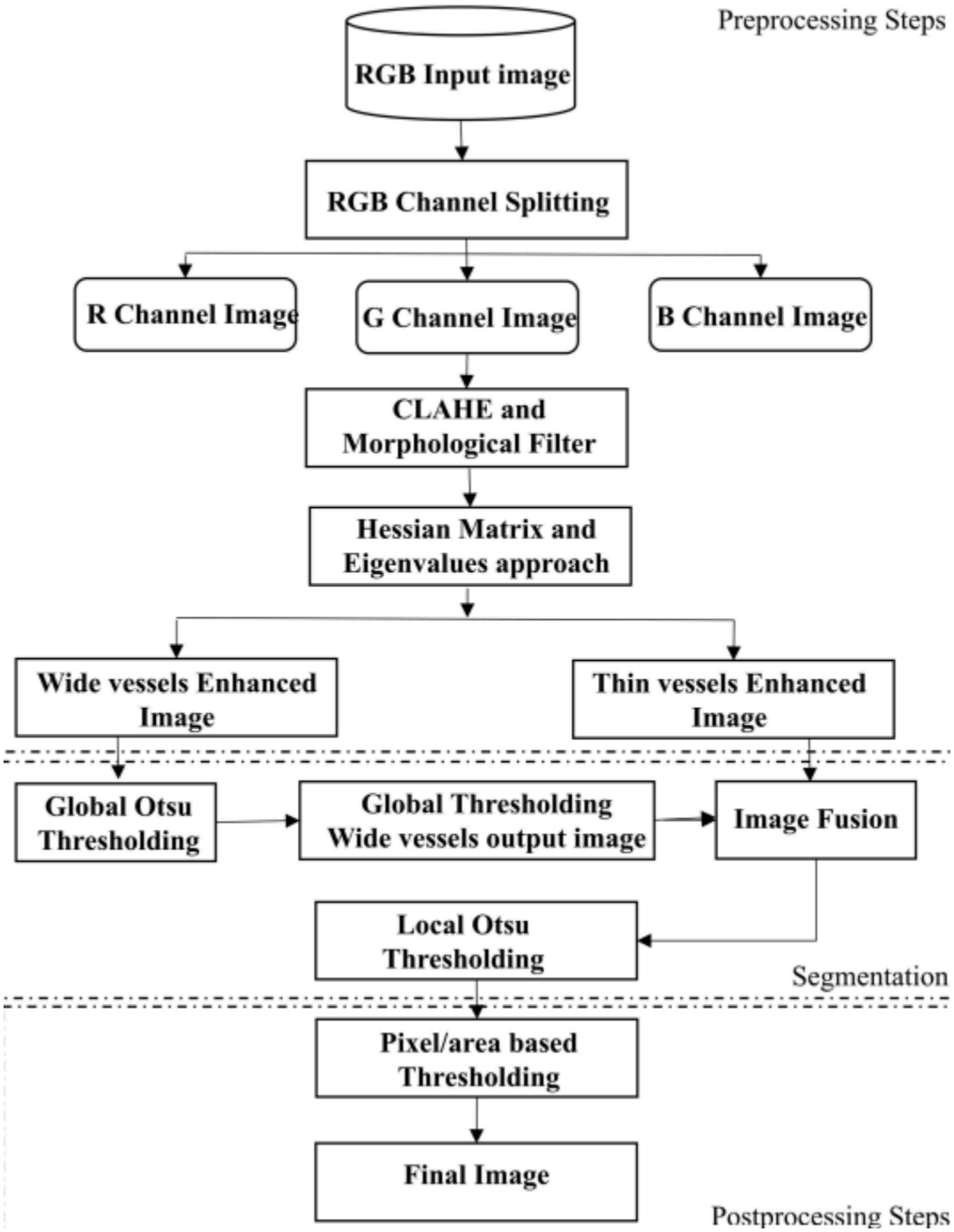
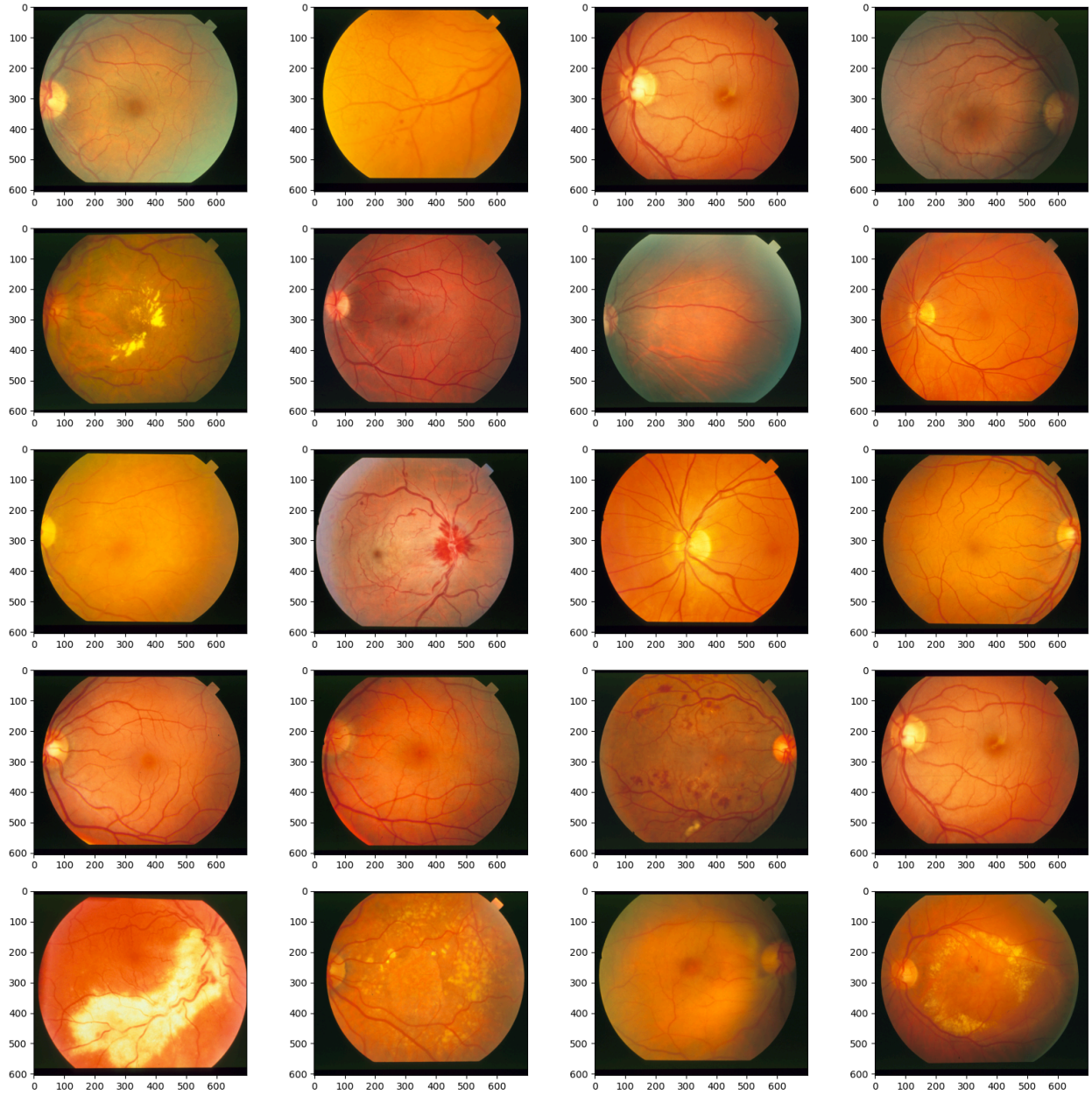
Enhancing Ocular Disease Diagnosis in Fundus Images (CSE499B)

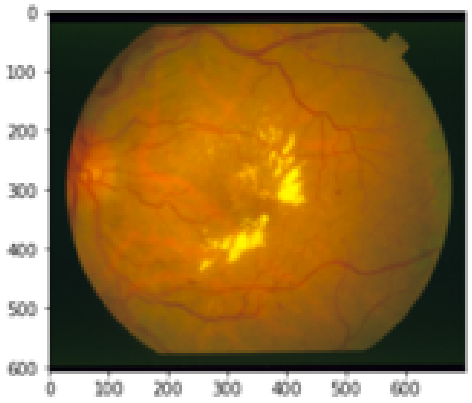
Flow Chart:



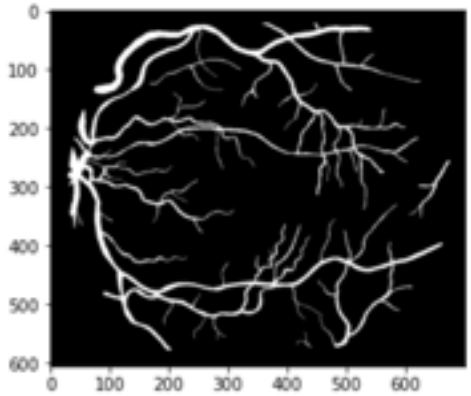
Dataset:

- Total 40 images
- 20 hand labeled vessel network images





Input Image

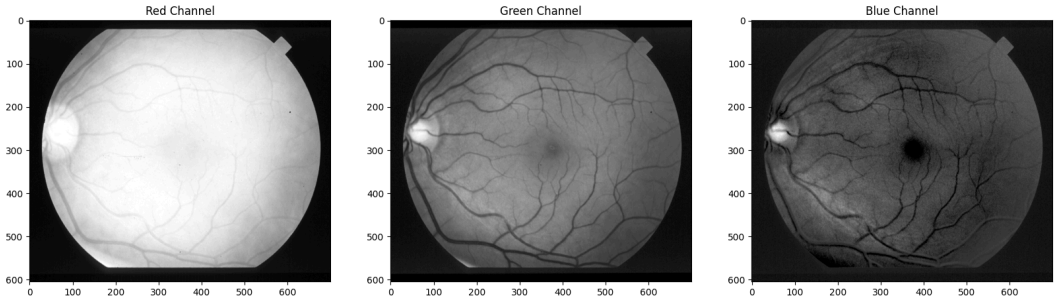


Hand labeled vessel network
Provided by experts

Methodology

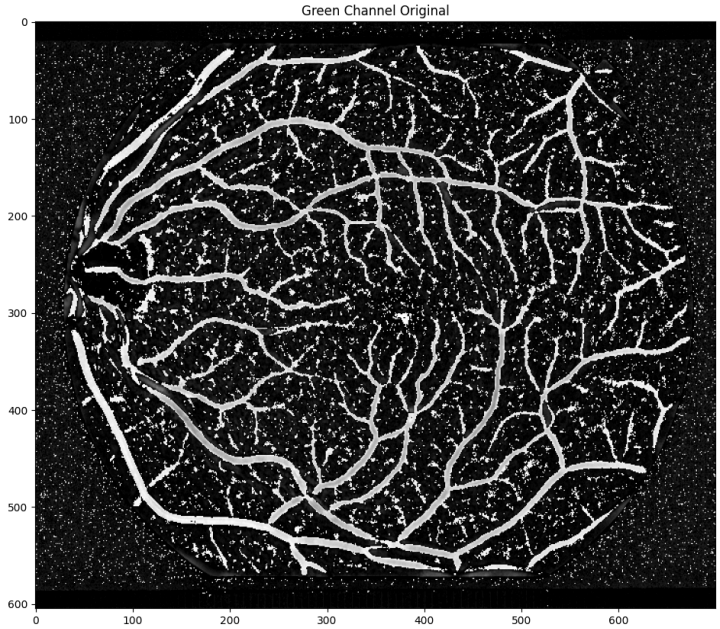
Preprocessing:

RGB splitting :

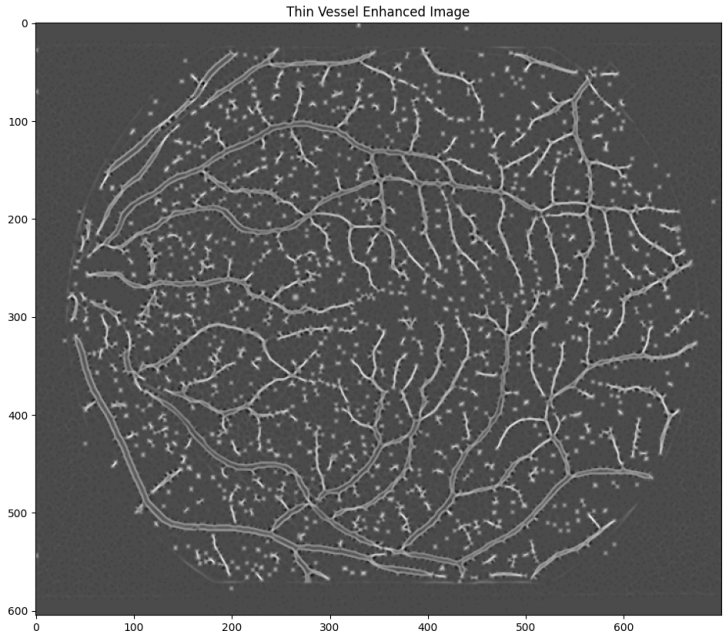


G channel > CLAHE :

Morphological filter :



Hessian Matrix :



Segmentation:

Global otsu thresholding :

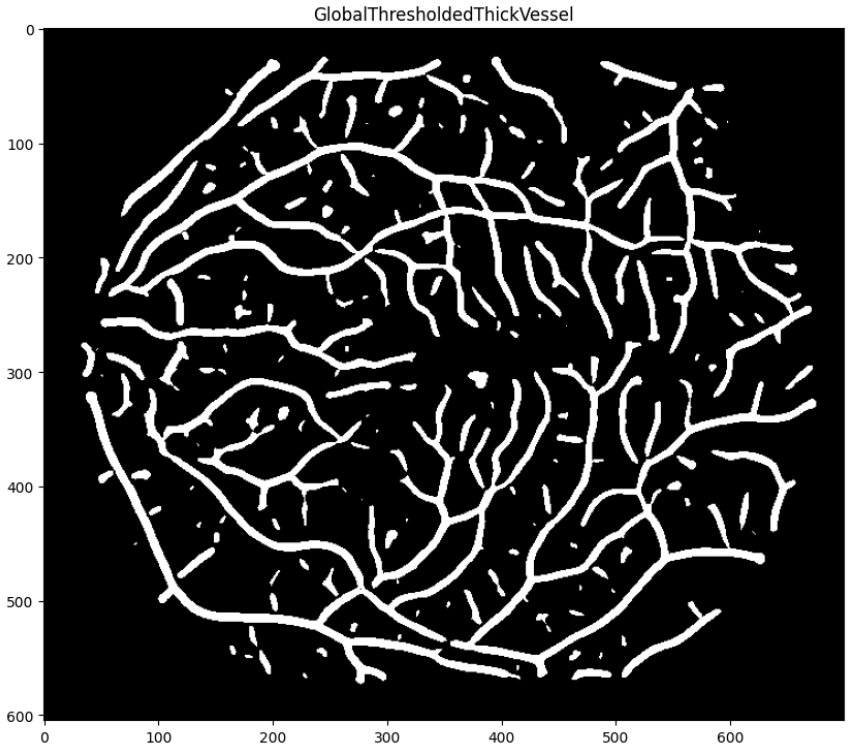
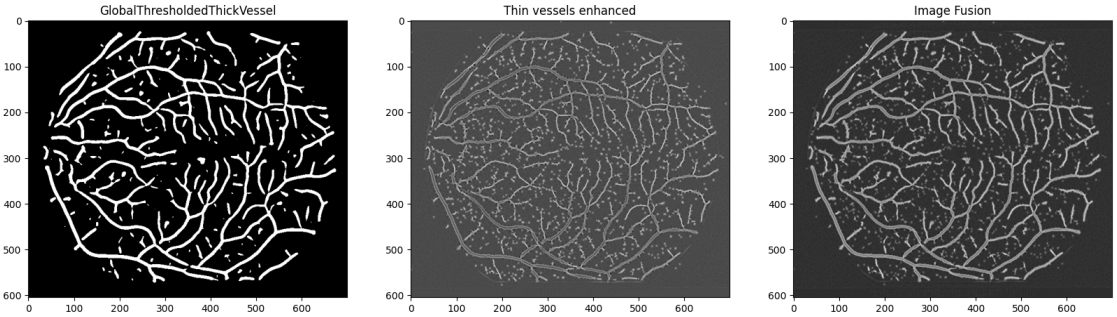
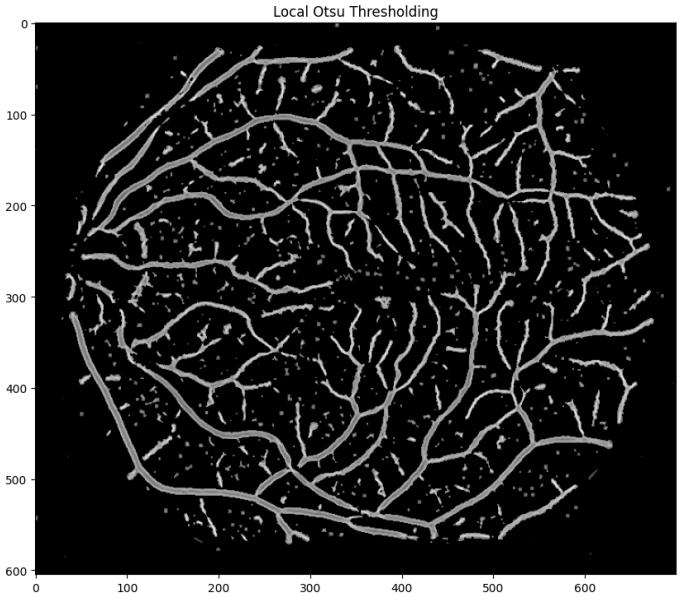


Image fusion :

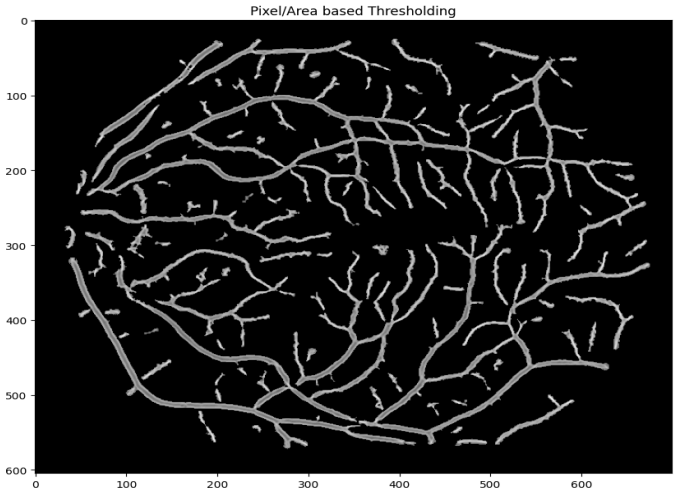


Local otsu thresholding :



Post processing:

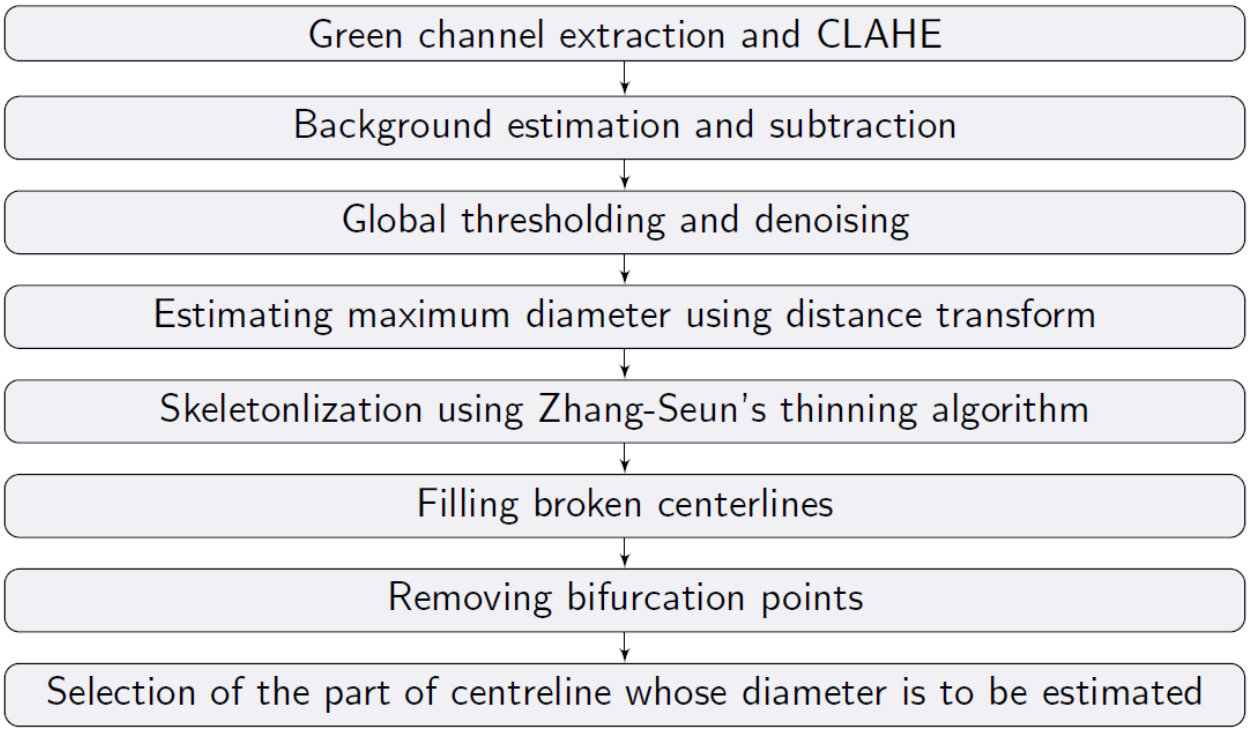
- Pixel/ area based thresholding :



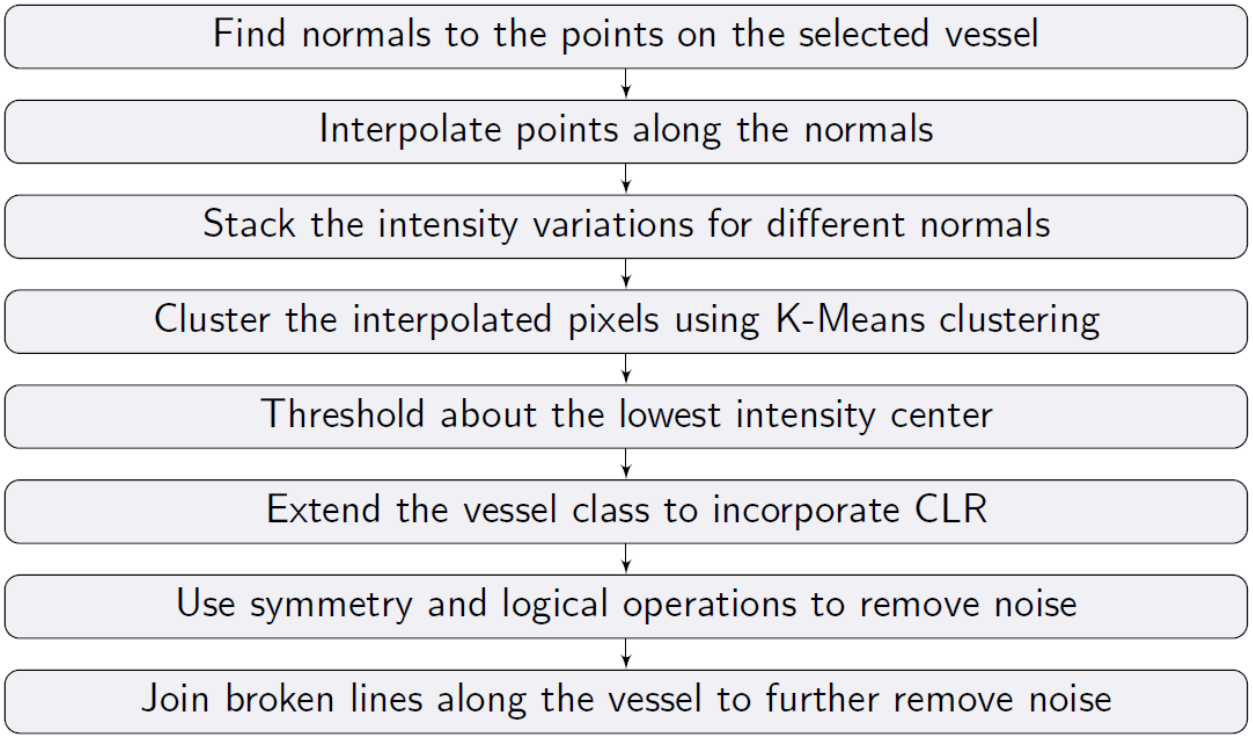
- Performance Analysis

Vessel Segmentation with vessel diameter estimation

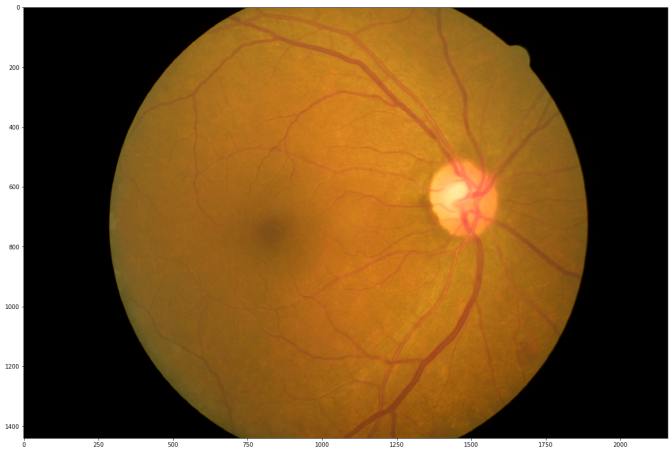
Flow Chart: Retinal vessel segmentation



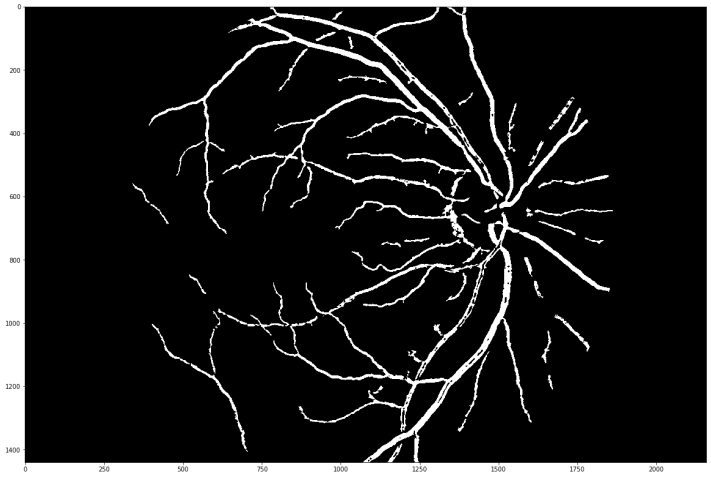
Flow Chart: Diameter estimation



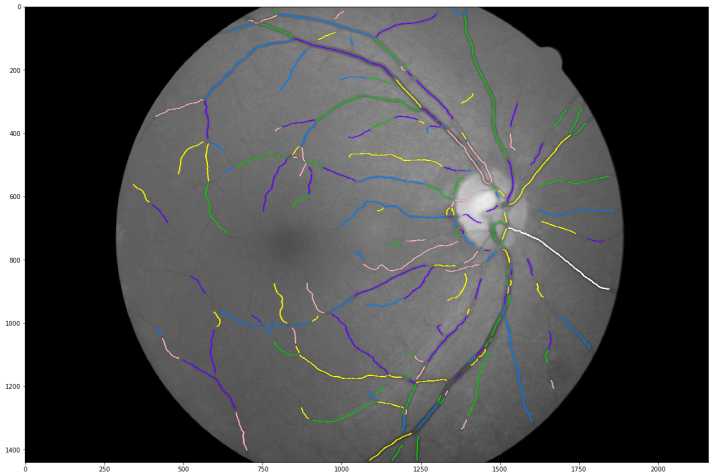
Input Image:



Segmented image:

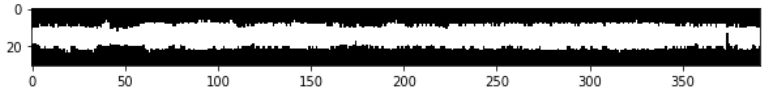


Centreline Map:

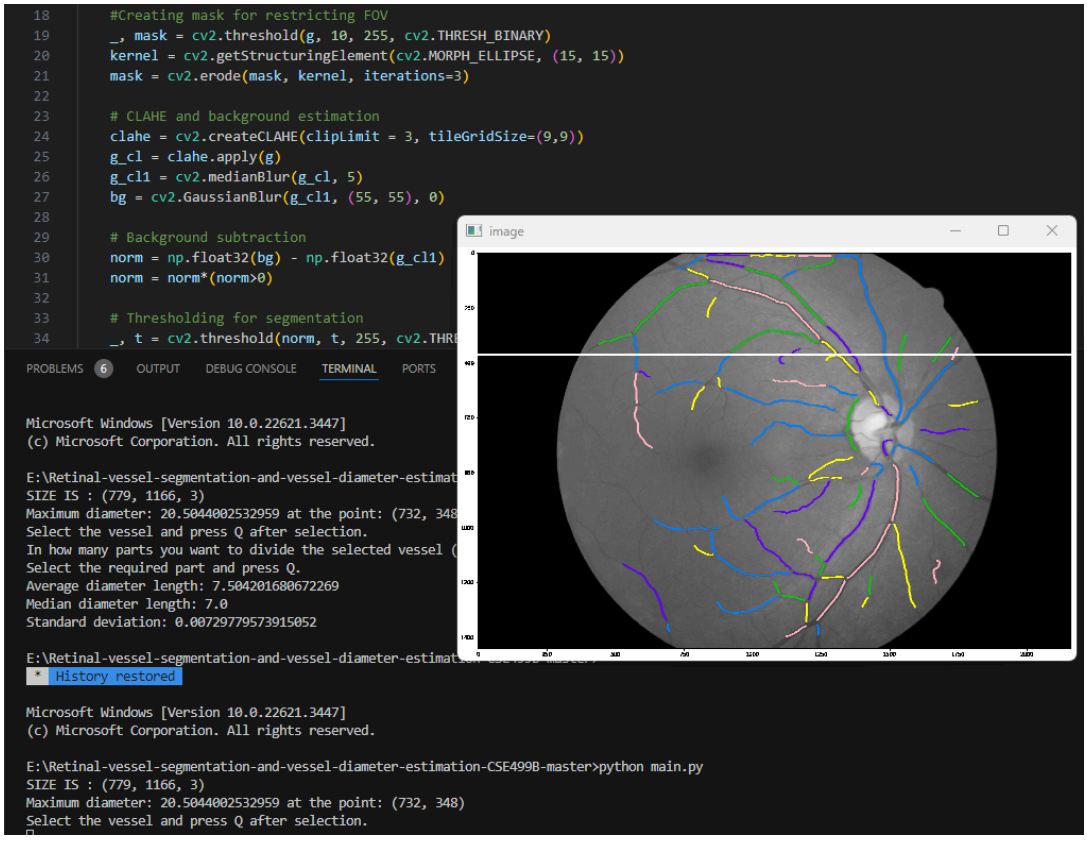


Interpolation normal to the centreline:

Diameters from clustered variation:



Visualization:



```
116             cv2.drawContours(cl, [c], 0, 0, -1)
117
118
119     # Centerline superimposed on green channel
120     colors = [(100, 0, 150), (102, 0, 255), (0, 128, 255), (255, 255, 0), (10, 200, 10)]
121     colbgr = [(193, 182, 255), (255, 0, 102), (255, 1
122
123     im = g.copy()
124     im = cv2.cvtColor(im, cv2.COLOR_GRAY2BGR)
125     thc = cl
126     thh = thc.copy()
```

PROBLEMS 6 OUTPUT DEBUG CONSOLE TERMINAL PORTS

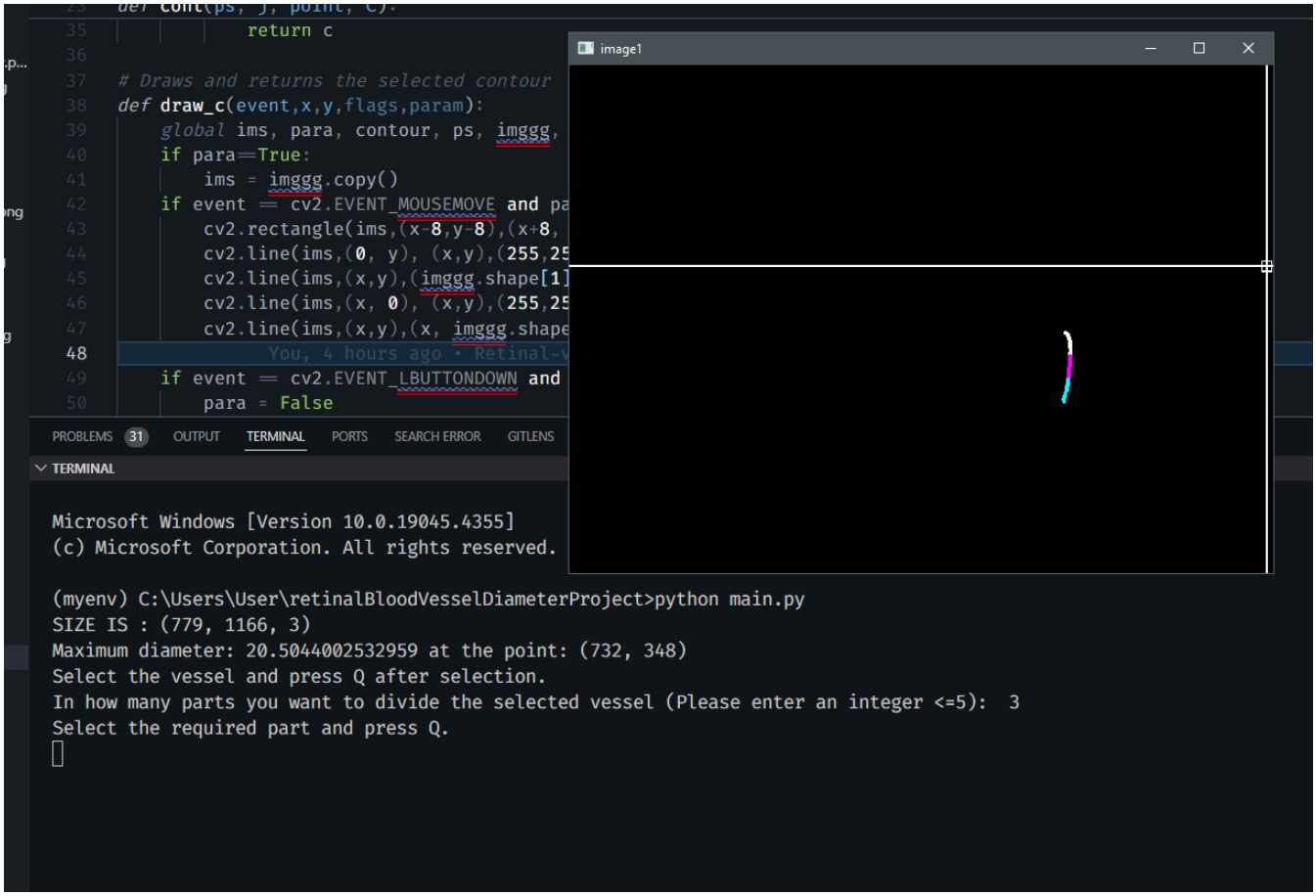
```
Microsoft Windows [Version 10.0.22621.3447]
(c) Microsoft Corporation. All rights reserved.

E:\Retinal-vessel-segmentation-and-vessel-diameter-estimation-CSE4

(myenv) E:\Retinal-vessel-segmentation-and-vessel-diameter-estimat
SIZE IS : (779, 1166, 3)
Maximum diameter: 20.5044002532959 at the point: (732, 348)
Select the vessel and press Q after selection.
In how many parts you want to divide the selected vessel (Please e
Select the required part and press Q.
Average diameter length: 6.821138211382114
Median diameter length: 7.0
Standard deviation: 0.004640076349999139

(myenv) E:\Retinal-vessel-segmentation-and-vessel-diameter-estimation-CSE499B-master>python main.py
SIZE IS : (779, 1166, 3)
Maximum diameter: 20.5044002532959 at the point: (732, 348)
Select the vessel and press Q after selection.
In how many parts you want to divide the selected vessel (Please enter an integer <=5):  3
Select the required part and press Q.
Average diameter length: 6.821138211382114
Median diameter length: 7.0
Standard deviation: 0.004640076349999139
```

Presentation last modified: 1h ago



Result:

```
(myenv) E:\Retinal-vessel-segmentation-and-vessel-diameter-estimation-CSE499B-master>python main.py
SIZE IS : (779, 1166, 3)
Maximum diameter: 20.5044002532959 at the point: (732, 348)
Select the vessel and press Q after selection.
In how many parts you want to divide the selected vessel (Please enter an integer <=5):  3
Select the required part and press Q.
Average diameter length: 6.821138211382114
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Standard deviation: 0.004640076349999139

(myenv) E:\Retinal-vessel-segmentation-and-vessel-diameter-estimation-CSE499B-master>
```