ASSIGNMENT

Vessel Segmentation using Morphology

You are given a set of color (RGB) fundus images. Develop a morphological vessel segmentation algorithm in following stages :

a) **STAGE-1** : Remove the bright, circular shaped Optic Disc. **(30 marks)**

b) **STAGE-2** : Extract the vessel map. Estimate the diameter of thinnest and thickest vessel (an approximate range of size of structuring element)

(50 marks)

c) **STAGE-3** : Binarize the obtained vessel map. Keep the connected components and remove small isolated patches (less than a predefined area). Smoothen the vessel map by filling unwanted gaps (holes) and removing spurious branches (if any). **(20 marks)**

Hints :

- Choose the single best channel/combination of channels for processing.
- Choose the appropriate structuring element (ball, linear, arbitrary or any other) to process OD, vessels etc.
- Choose appropriate morphological operations like : Opening, closing, top-hat transform etc. for each stage.