# Semester Project proposals (IIP course)

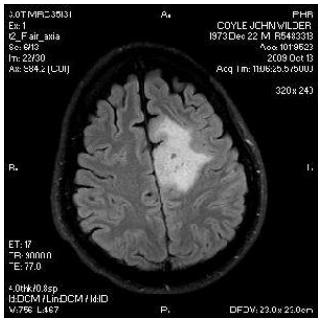
1. **Brain tumor segmentation:**

   You will find brain MRI images on the link below, do image segmentation by applying global operations. You may also use image enhancement techniques prior to segmentation to improve your results.

   https://www.kaggle.com/datasets/navoneel/brain-mri-images-for-brain-tumor-detection

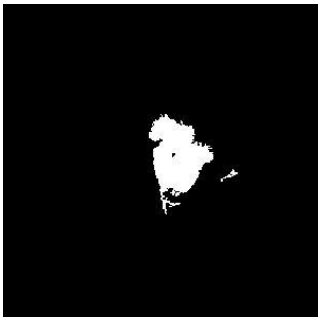
   Note: You can also use data from other online free available datasets of brain scan images.

   **E.g:**



Brain MRI with artefacts and labels

Tumor detection with artefacts and labels



Segmented tumor without artefacts and labels

2. **Number plate identification:**

   Extract out the alphanumeric from an image of a car/bike number plate. You can use morphological operations to perform this task. The image is preprocessed prior to any morphological operations to get the best results.

   You can make your own dataset by taking pictures of random number plates (keeping the fact that they should be on heterogeneous formats i.e., Punjab, Sindh, Capital number plates). In case of your own dataset the number of dataset items should be above 25. You can use a free available dataset if available.

   **E.g:**


Input image

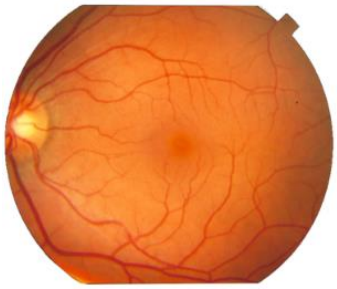

output image

**3. Detection of structural elements in fundus image:**

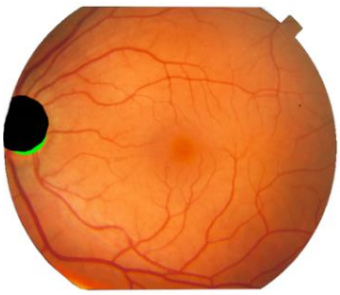
Extract the main structural elements (optic disc, vascular pattern) from a colored fundus image. You can extract these elements based on their pixel intensity values after applying histogram stretching/equalization to ease the task.

Hint: Use green channel of the colored fundus image as this contains the maximum information of the structuring element instead of grayscale version of the original image.

**E.g:**

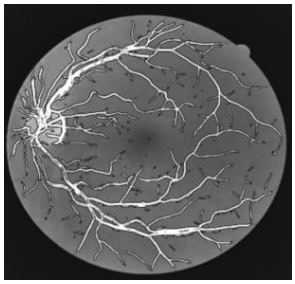


input color retinal fundus image

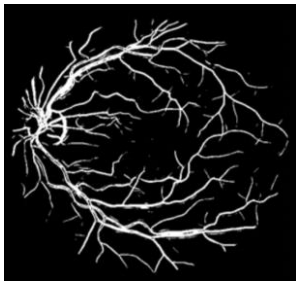


detected optic disc from input fundus image

Input color image



blood vessels segmentation



binary image of extracted blood vessels

**4. Other: Students' proposed projects**

Other than above mentioned projects, students can propose a project by **January 9th 2024**. The proposal should be submitted in a written document of maximum one A4 page (12 font size text), containing ***(a) Project title (b) Group members (c) problem statement (d) project achievable goals and (e) contribution of each group member.*** The project proposal would be evaluated and after the class teacher approval the project outputs will be documented and submitted by the project group.

**Group members allowed:** A max of 3 (or 4 in case of a project with relatively bigger problem and project achievable).
**P.S:** Project group is not necessary; a student can do the project individually.

**For evaluation:** Project marks would be decided as per the documented and achieved goals by the research team members and their contribution to the project. Keep in mind, the project marks could vary from one member to another depending on their individual contribution to the project.