Eye Tracker

SE367 Cognitive Science

Design

Very initial design plan

One camera on the screen in front which will determine what the user is looking on the screen using lot of machine learning techniques

Impractical -> Too much calibration required for using every time

2nd Design Plan

2 cameras , one for each eye. One above the head.

Becomes very heavy

Design

Final design

Cameras

One top mounted camera

Another camera for the eyes

IR

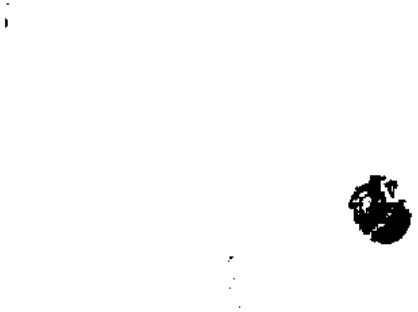
Using daylight or Lamp IR for the moment

Working principle

Eye camera Image	Image from head camera
Only eyeball move in the complete picture	Shows what the subject is looking at

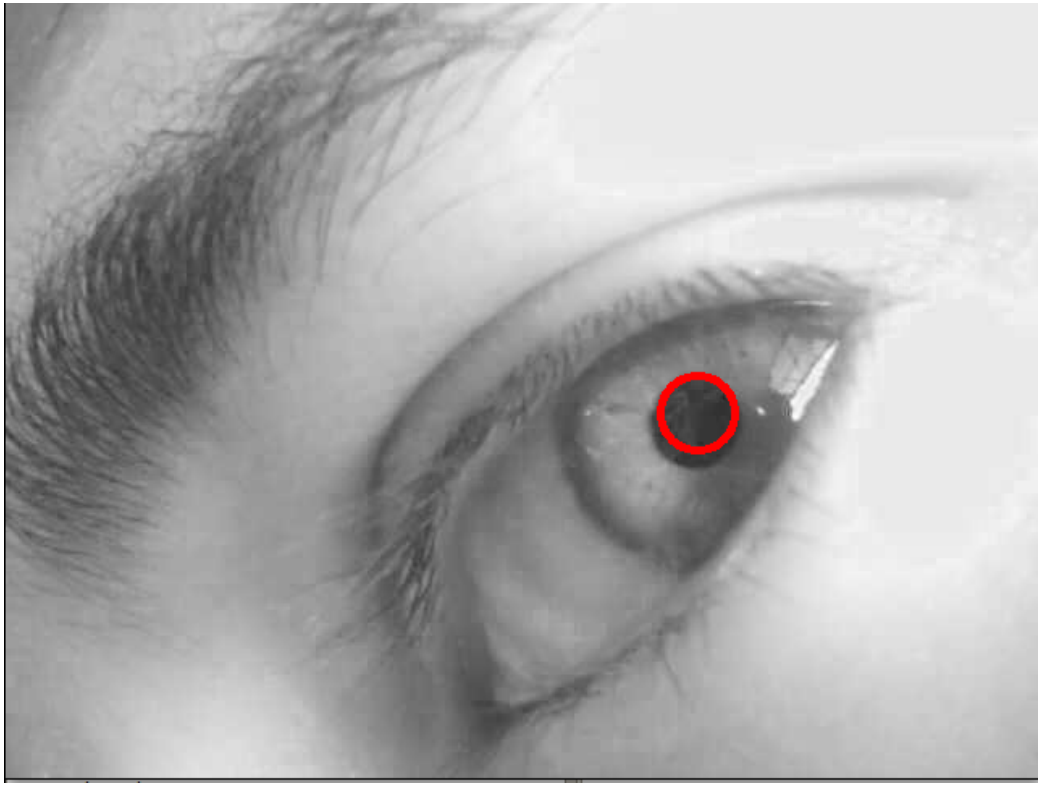
Processing eye

We obtain position of Iris by processing the eye
Since head is stationary with respect to camera, no detection is necessary
Iris can be extracted by simple binarization -> median filter -> dilation



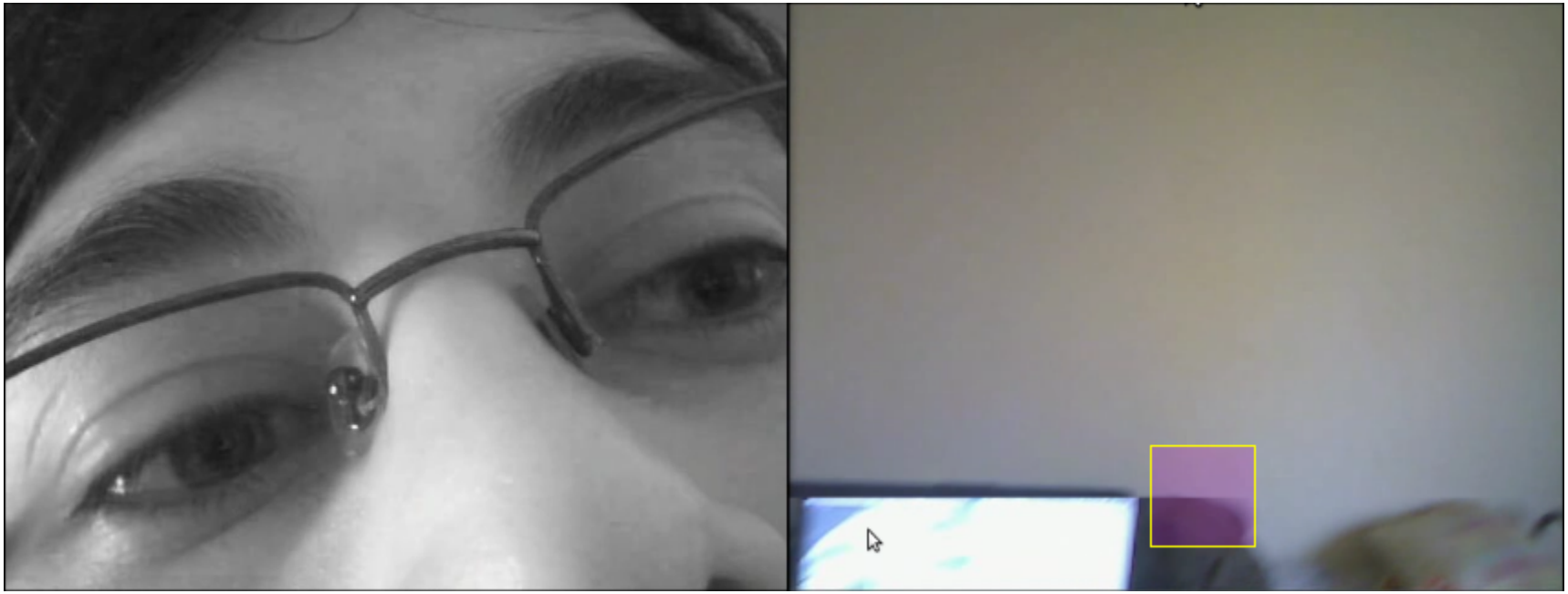
Processing eye

Iris location can be obtained with very high precision



Gaze point

Using iris location, gaze point is decided on the image obtained from head camera. This part is done using a neural network(using Flood3 Neural Network library)



Calibration(not working)

- User choses initial viewpoints if gaze is marked wrong.
- Final gaze calculation should be adjusted accordingly.