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# A portable gaze monitoring system using Raspberry Pi

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## 1. Introduction

The availability of small portable Linux computer promises a new era in portable gaze tracking solutions – for example walking or driving. This project attempts to build a gaze tracking system using the Raspberry PI. Specific focus will be given to the performance and specification requirements for implementing for 700Mhz ARM-11 processor and 512 Mb memory and the use of formal software engineering techniques.

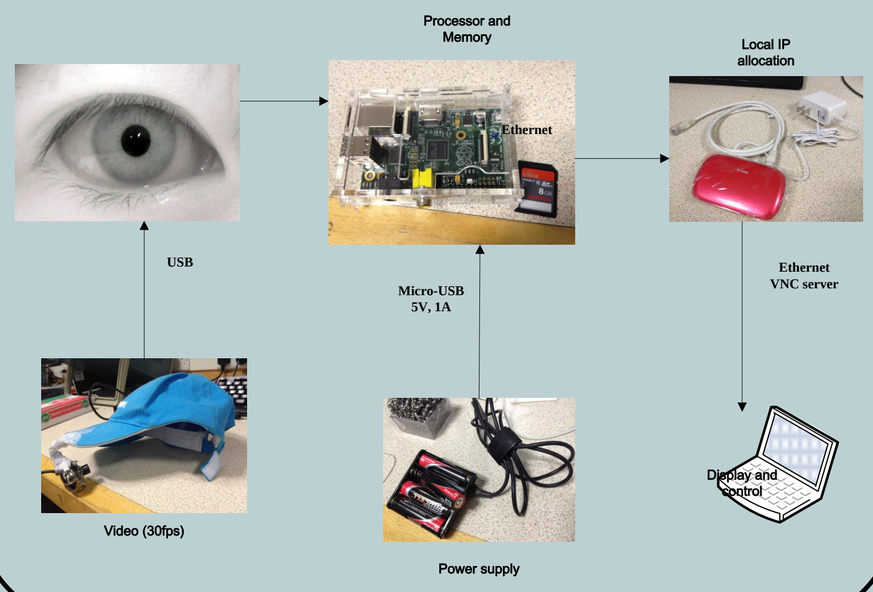
## 2. Hardware

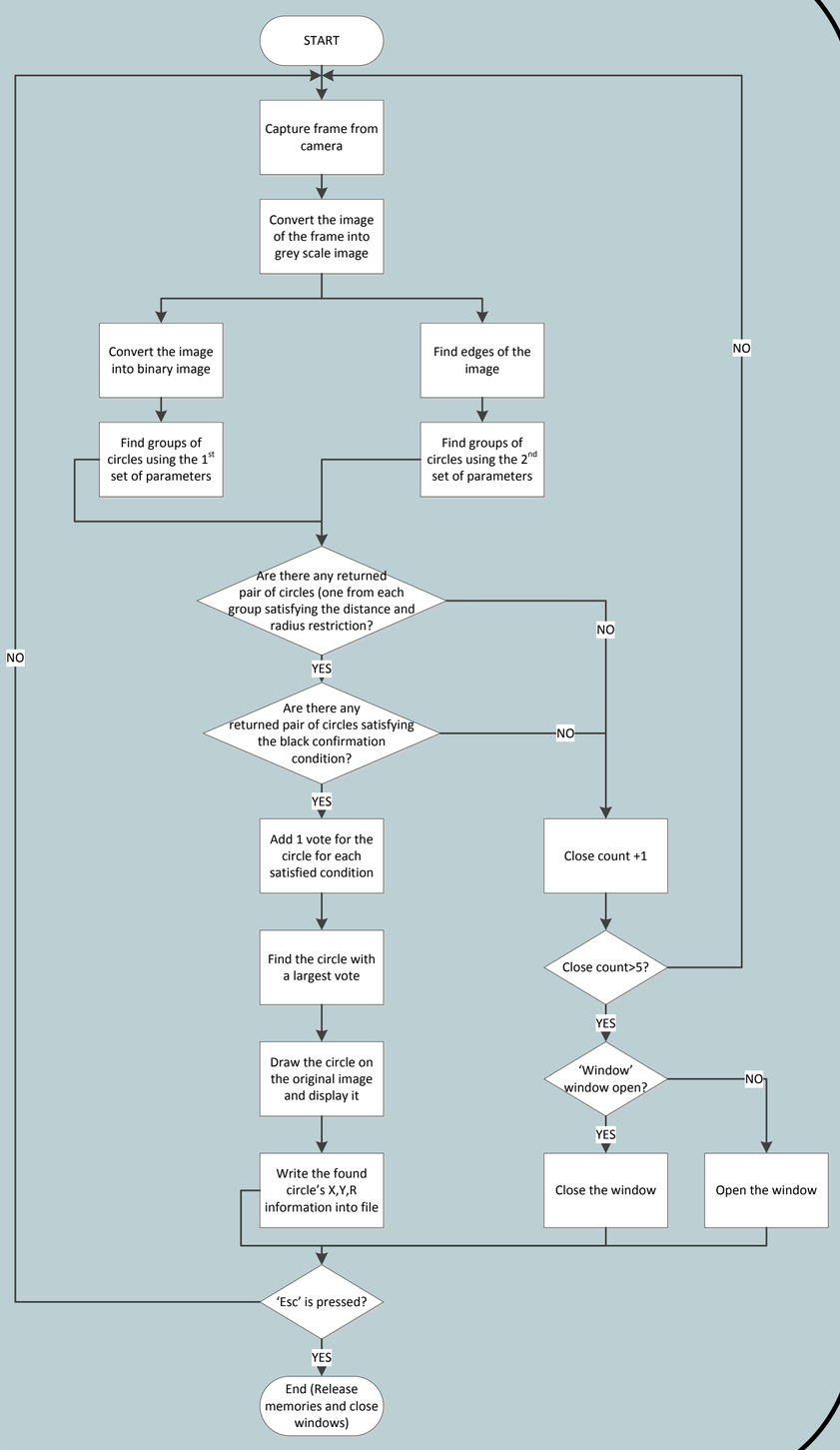
a). Hand-adjusted focus of the camera
- Higher resolution of images
- Focus adjustments before use

b). Raspberry Pi (model B)
- Processor: Broadcom BCM2835 SoC
- VNC application controlled and displayed by PC in this project

c). D-Link router : local IP allocation. Connect with PC and Raspberry PI

d). Portable Battery supply
- USB to Micro-USB cable
- 5V, 1A (maximum) power supply into R-Pi




## 3. Software

a). Development of the software
- C language + OpenCV library for image processing
- Key algorithm used : cvHoughCircles
- Modification—minimize the impact from iris, reflection and eyelashes

  Double use of the algorithm with different set of parameters and different source images.

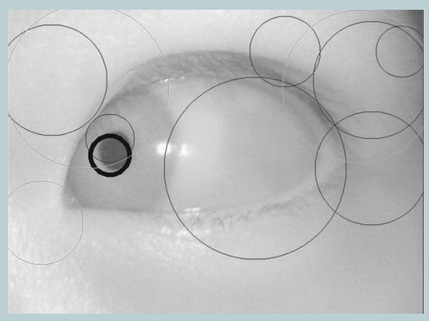
  Value of circle (r = R/2) and circle (r = R/3), threshold being over ½ of the pixel dots has value under 128 out of 255

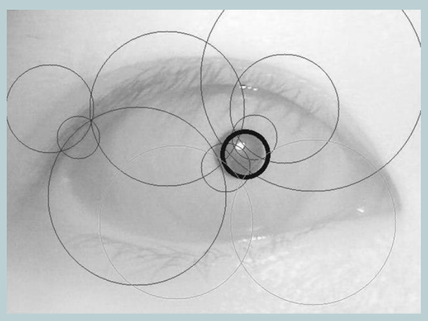
b). From PC to Raspberry Pi
- Reduced processing speed---Resize the captured image from camera from 640*480 (pixels) to 320*240
- Reduced output speed---Display 160*120 resolution image

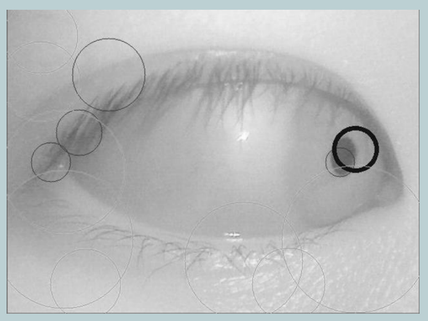
## 4. Performance

Closure: ✓ Direction: ✓ Cognitive Workload test: ✓

Environmental Difference test: ✓ User-difference test: ✓







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