Report 1

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Objectives achieved this week:

- Setting up environments and dependencies.
- Successfully generated individual pictures from video file.
- Able to identify non-blinking images and blinking images.
- Able to track pupil positions.

Obstacles remained:

- Run time efficiency
- Auto generating parameters

Results Demo:

Origin Image (One single frame from thousands of frames in the video)

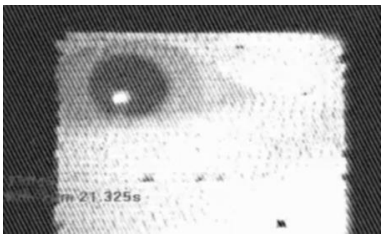


Image after blurring (To remove noises and to get more precise result)

Parameter1: blur = (120,120)

Image after Threshold (To eliminate grey element in the picture to get a more precise result)

Parameter2: threshold = (120, 250)

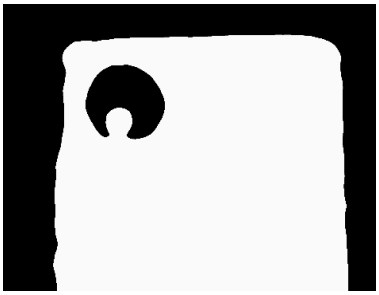


Image after Canny (Finding the corner element from the threshold image)

Parameter3: canny = (30, 40)

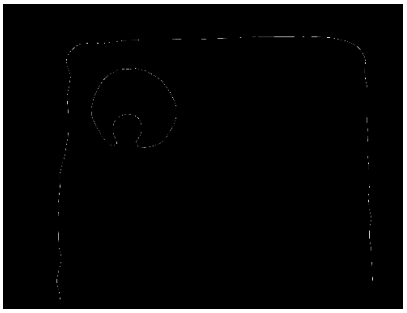
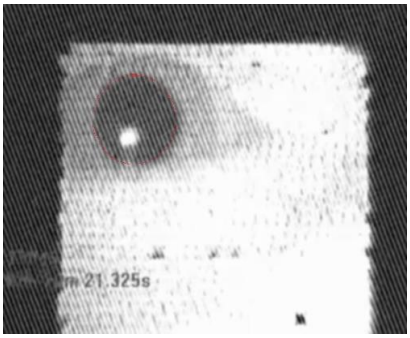


Image after Hough Transform (Core algorithm to find the “perfect” circle in the image as marked by red)

Parameter4: radius = (230, 300)



Conclusion: After implementing a series of image transforming algorithm, the eye pupil position is successfully located (glint could be located using the same method). However, the entire process took 50 second to process one image left alone thousands of other images needed to be process using same methods. Possible solutions for runtime efficiency – supervised learning, optical flow, parallel programming.

Moreover, parameters 1 to 4 would be programmed to be self-generative by machine learning algorithm to get the most prioritized results.