About general method:

A Haar Cascade classifier in order to detect eyes is used. After detecting eyes, we detect the iris by calculating the centroid. Here, Hough transform has not been used because images have a lot of edges and it was not giving any satisfying results, as using deterministic methods I decided, I found calculating the centroid method which gave better results than Hough transform.

Results by groups:

Below we see that, while detecting images of eyes having direction to the left, all eye directions were detected right except the ones in which Haar Cascade was unable to detect eye positions. For eyes having the right direction, they are also having good results however beside having an image of non detecting eyes, it also has 2 false results. And finally, images having a center direction is the most challenging group which

Left)
    Good results: left01(a good image), left02(image with glasses),left05,left06,left08,left09,left10
    Eyes were not detected: left03, left04, left07
Right)
    Good results: right02,right03,right04,right07,right08,right09,right10
    False results: right01(image with glasses but detected center),right05(detected left),
    Eyes were not detected:right06(there are glasses)
Center)
    Good results: center01, center03, center04, center08,
    Corrupt JPEG data: center02(detected right)
    False results:center05(one eye, detected left),center06(surprising result, detected left),center07(right detected), center09(right detected)
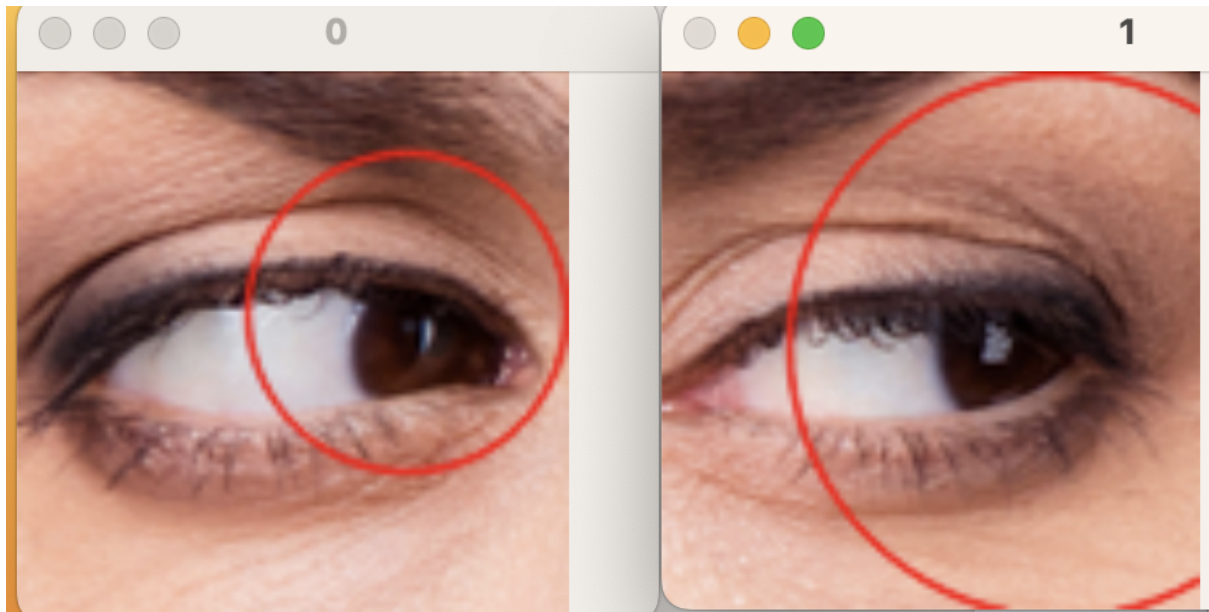   Eyes were not detected: center10

Note: Interestingly all of the gray photos were detected accordingly. Gray photos:right08,right10,center03.

Superimposition on original images:

Here we will discuss some results while having a closer look at them.

Good results:
left01: we have cropped a photo of the eyes and also iris was detected and circled.

left02: Here we got 3 eyes found by the result of Haar Cascade Classifier, however, the other two are eyes and we could detect the irises and have a good result. But not finding both eyes or finding another Interest point which is not an eye, is also one of our problems.
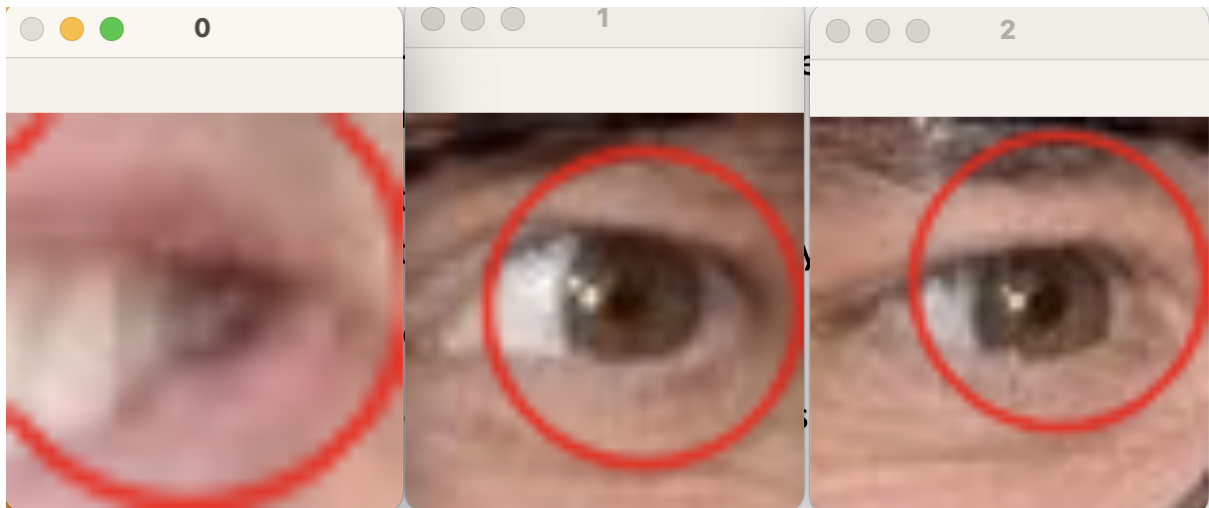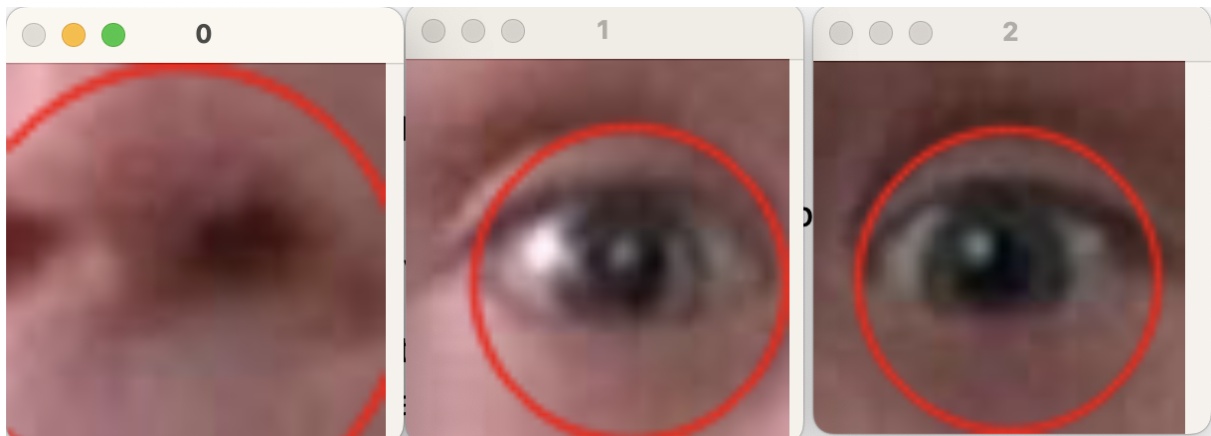

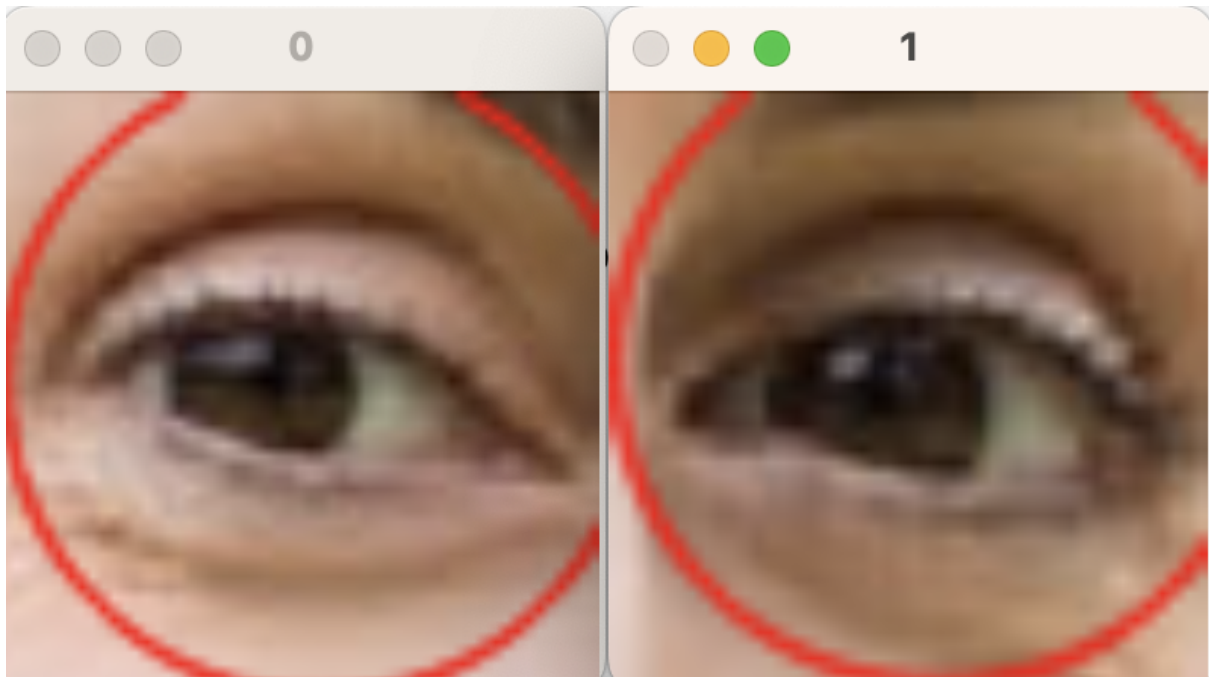left07: Here for example, no eyes detected which is surprising.

Bad result:

center06: the result is not right and we also find 3 eyes which is not true. Detected left.

right05: Detected left. Obviously, mistakes come from an angle.The head is rotated in the photo.

Results:

Evaluation results:

Accuracy: 0.633333

Confusion matrix: (L R C)

[7, 0, 3;

 1, 7, 2;

 2, 3, 5]

Possible improvements:

For the images which have not good results are the ones mostly having rotation. Using an additional weak classifier was thought but there was not enough time to implement it totally. Its idea was to consider white parts of eyes near pupils. With looking at the intensities, if it has larger intensity on the right, it has the right direction and vice versa. But unfortunately, activating it gave worse results because of not having straight images. They are mostly rotated. So, using methods to ignore rotation would improve results. Flandmark was found as one of the methods with the result of a quick state of art review. Which it detects face landmarks despite -45, +45 degrees rotating.