TRF ROBOSOFT IMAGE PROCESSING TASK-1

GROUP 2-

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Task- SHAPE DETECTION

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31 August 2020

We were given task "SHAPE DETECTION "program where we had to detect - Circle, Square, Rectangle, Pentagon, Ellipse, Triangle in the given image. In the first meet we decided to do individual research and then finalize the approach.
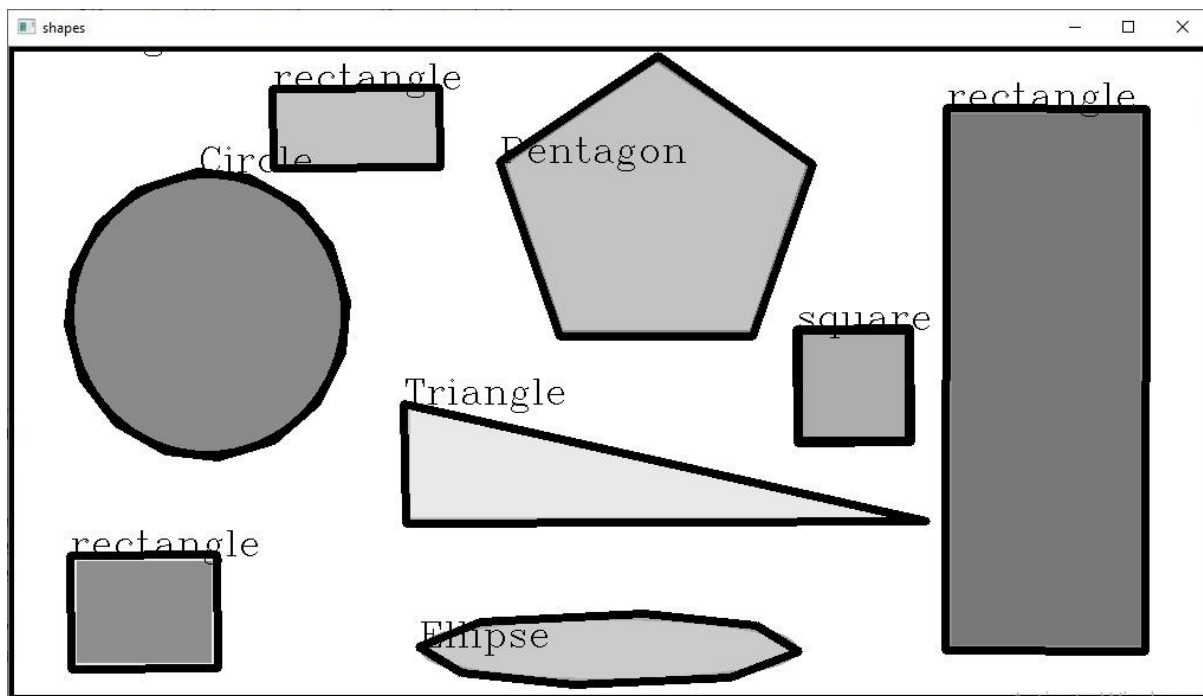
1 September 2020

After referring to YouTube videos and some related blogs we decided to apply **thresholding** and use **contours for edge detection**.

2 September 2020

 In this meet, we wrote the code and implemented the program on different shapes. After **Completion of the program for shape detection in given image** we updated to the mentor.

OUTPUT

On **2 September** mentor had given us the improvement to make "**DETECT THE SHAPES IN REAL TIME**". And we all started working on the task by doing individual research on given improvements.

3 and 4 September 2020

We first tried using thresholding and contouring but it was detecting any random shapes due to noise so we finalized using colour masking technique and contouring to detect rectangle, square, circle, triangle and pentagon. The code failed to differentiate between ellipse and circle. We were asked to study Hough Circle Transform. We then implemented it but it did not work as it kept detecting multiple circles in the image.
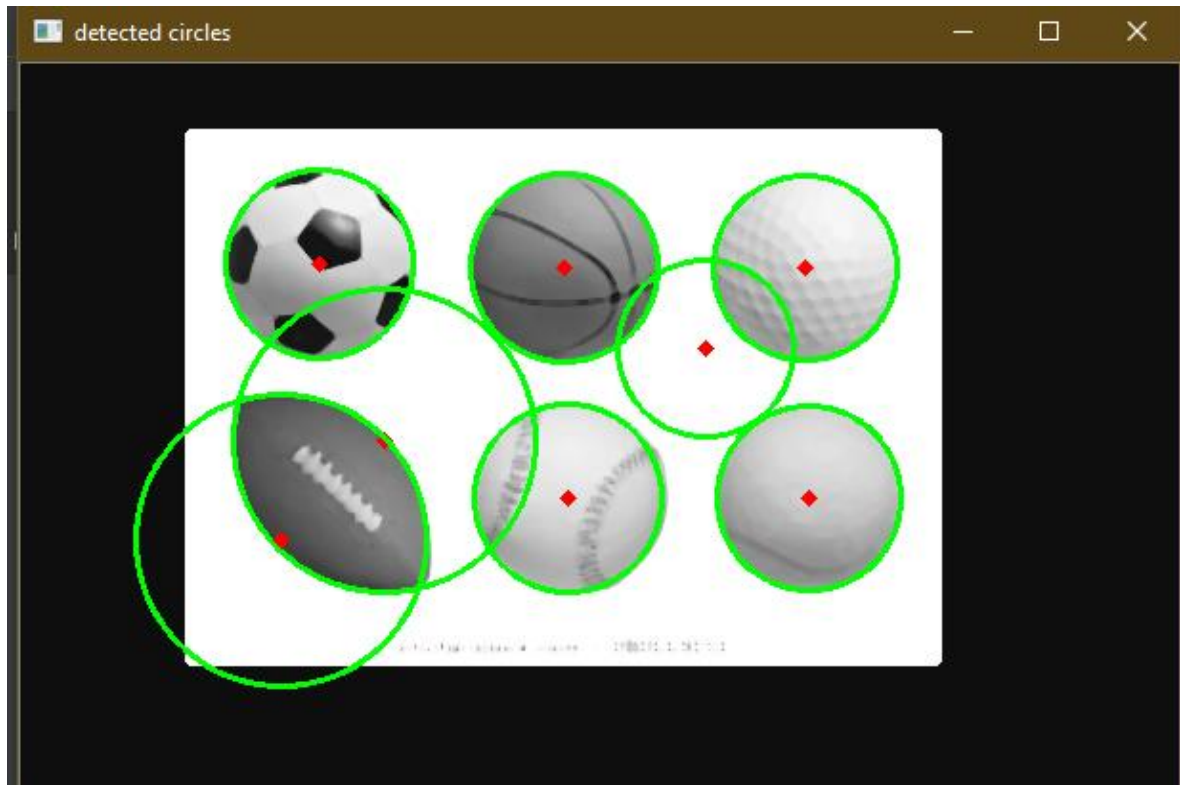
5 September 2020

We presented the progress of project in the meet held on 5 September. After the meeting we started working on the improvement suggested in the meeting. We decided to read about Hough line transform and Hough Circles and implement them.

**Improvements -1) Detect shapes without colour mask.**

2) Count the frequency of each shape.

6 September 2020

We implemented Hough circle on an image, changing few parameters and it worked but not completely accurate. Then we implemented Hough line transform where it detected the objects perfectly but could not figure out how to predict the shape using that information.
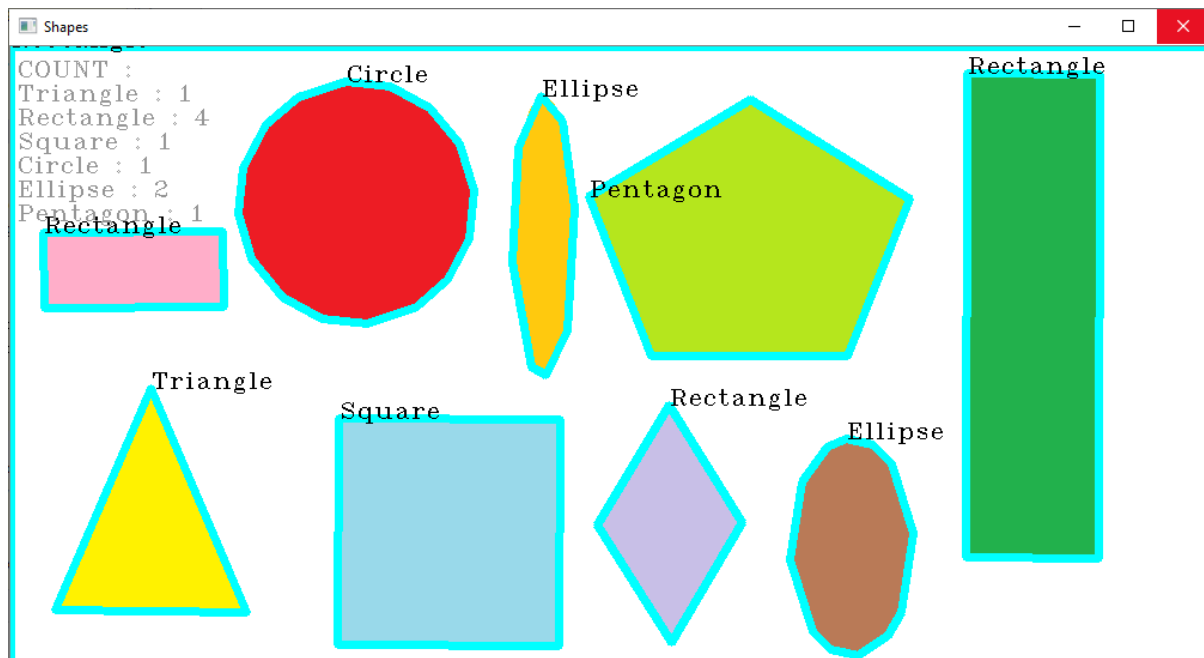

a) Output of Hough Circle Transform
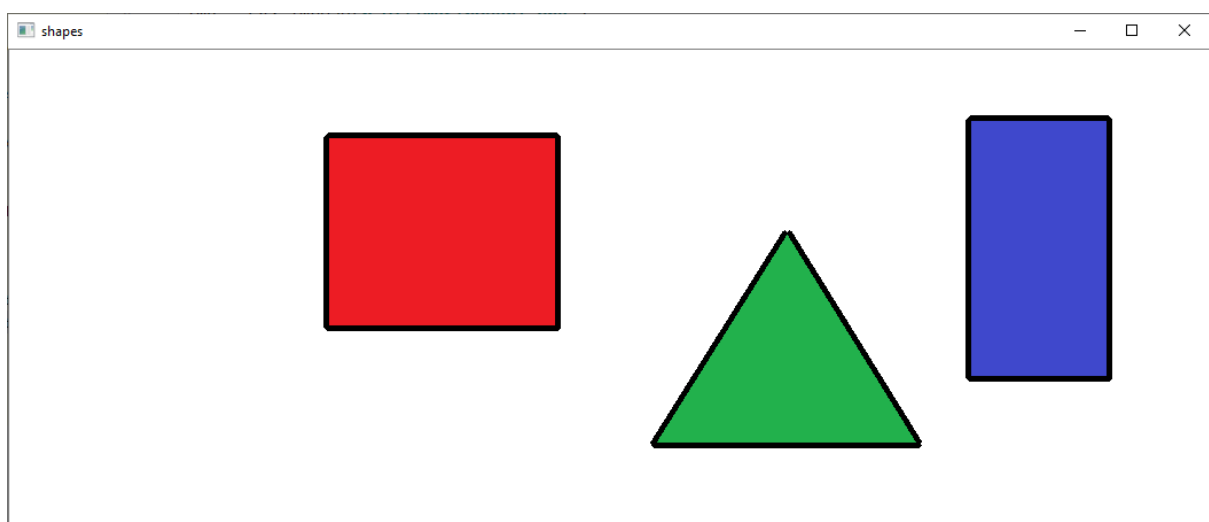
b) Output of Hough Line Transform for detecting shape edges.

7 September 2020

We added the count shape feature to previous code of "Shape Detection in Image". We then tried reading about other approaches for real time shape detection like dilation concept, canny-edge detection, etc .

a) Output of shape detection in image where it shows count of each shape.

8 September 2020

We then tried the first approach again i.e. thresholding and contouring but we increased the value for contour area condition to avoid the unnecessary detection of random objects and also decreased the threshold value in cv2.threshold() function. The final code was able to identify the shape and print it. But there is issue with counting, the same object gets counted every time the while-loop runs. So, it gets detected multiple times. We tried using time-delay but that does not help.
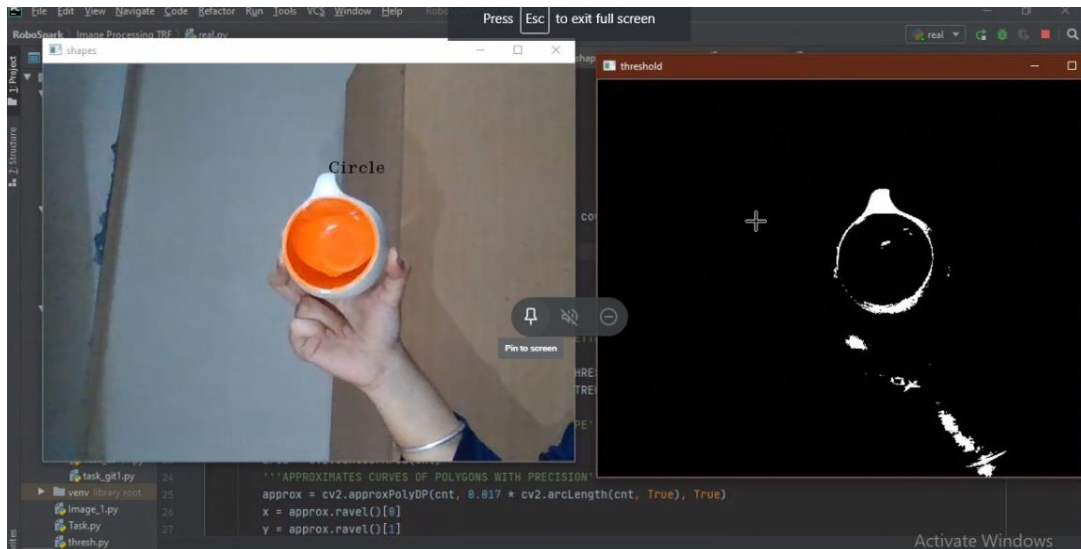
a)   Final Output of shape detection in real time.

Task completion timeline

31 August – **Task given for simple shape detection**

2 September - **Done with program for simple shape detection, started work for real time shape detection.**

4 September - **Presented the work till then, and started working to detect shapes without masking the image and count the frequency of shapes.**

8 September - **Done with program to detect shapes in real time. Also, added count shapes to both the programs of shape detection in image and real time.**