



Training: OpenCV

--To perform some basic operations on Images.

After training, you would be able to do-

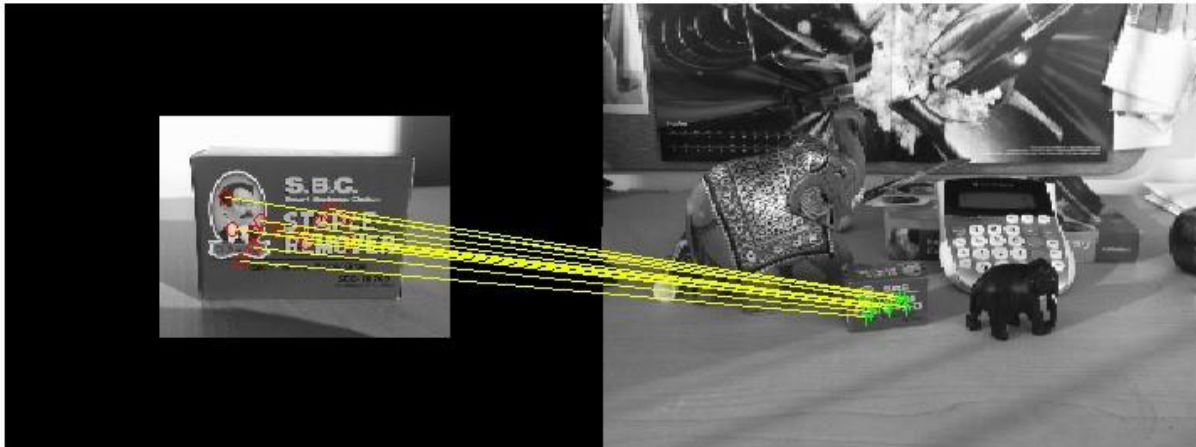
Feature detection



Corner detection



Feature matching



And lot more....

Facing any problem

("YOUR SAVIOUR IS HERE")

- 1 - Google
- 2 - Stack overflow
- 3 Opencv official website https://docs.opencv.org/3.4/d9/df8/tutorial_root.html
- 4 Your teammates and mentors

We encourage you to refer material apart from the stuff given below as well to expand your understanding. We have tried to curate a list of resources we found would utilize your time the best way.

Please read the entire document before beginning with anything

This assignment in particular has less material and has been allocated more time in the proposed timeline. Intention is to encourage the exploration of this topic apart from the basic topics given here. Please try to utilize this time as wisely as possible. Many interesting applications will appear depending on your research.

Downloading OpenCV

Create a virtual environment

1. Install pip
2. Install python
3. On command line



pip install opencv-python
<https://pypi.org/project/opencv-python/>

Timeline:

TASK	Average Time Required
1	15 mins
2	15 mins
3	30 mins
4	1 hour
5	1 hour

TASK-1

1-Basic image read

Import cv2 (ps whatever the version u downloaded you have to import as cv2 only)

imread- [load an image](#)

imshow-view an image

imwrite-save new image

2-Colour thresholding [colour thresholding](#) (don't get into ottu's method maths)
[Hsv thresholding](#)(no need for visualization)

Assignment 1

1.1-Import your image and convert to black and white and in greyscale.

1.2-Start live video with OpenCV using webcam

1.3-change the colour of everything in your image from a red colour to blue colour.

TASK-2

1-[Geometric transformation](#)

2-[smoothing](#)

Assignment 2

2-Make 10 alternate images from the image given below such that all image contains "T".
Use 4 translation,4 rotation and 2 blurrings at least. You can be more creative



This task is also called DATA AUGMENTATION

TASK-3

In this, you will see how we detect the edges.

1-[Image gradient](#) (Don't worry if you don't understand the maths;))

2-[Canny](#) (P.S. this method would look cool now but don't use directly for some practical task)

Assignment-3

3.1-Make the pencil sketch of an image that you imported for assignment 1

3.2-Try it on the live video feed.

TASK4

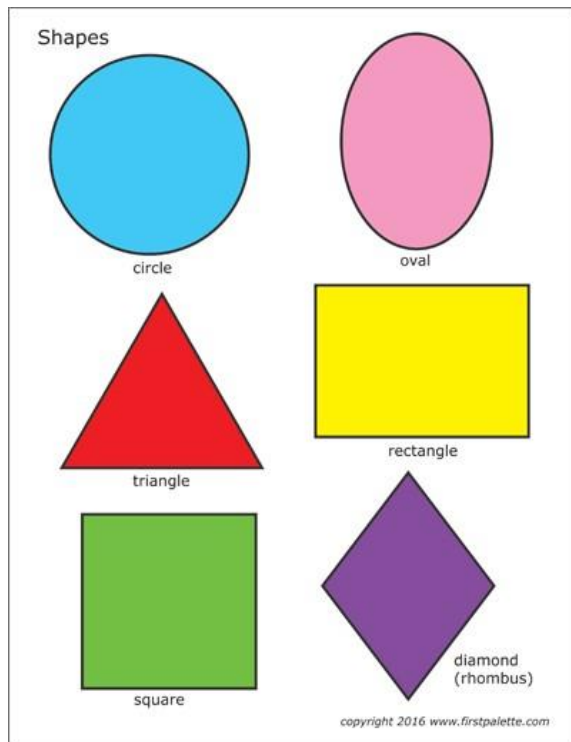
1-Do the first 2 tutorials

https://docs.opencv.org/3.4/d3/d05/tutorial_py_table_of_contents_contours.html

Assignment 4

4.1-Given the image distinguish between different shapes.

Like your model should be able to detect the centre and classify these shapes in the image automatically.



TASK-5

In this, you will learn about feature descriptors and feature matching algorithm:

https://docs.opencv.org/3.4/dc/dc3/tutorial_py_matcher.htm

Do face detection using Haar cascade:

https://docs.opencv.org/3.4/db/d28/tutorial_cascade_classifier.html

Assignment 5

5. 1-Search the ball in the video using circle shape detection in the video
- 5.2 Search the ball using ball and frame as feature matching. (so that it doesn't detect any other thing than the ball)

[Lionel Messi video](#)