Air Strokes Project - using OpenCV

By: Khyati Parashar

Problem Statement

This can be used by teachers for effective online teaching, as at times a teacher has no direct access to any black/white board for explaining things.
This can come in handy in such situations.
As drawing in air gives you more control over the movements as compared to using mouse/graphics pad for drawing/writing.

Project Description

Given the real time webcam data, this air canvas-like python application uses OpenCV library to track an object-of-interest and allows the user to draw by moving the object.

Requirements

Software requirements : Python 3.7

OpenCV library

Any editor that supports python

Hardware requirements : Webcam for live video streaming

Laptop/PC to code

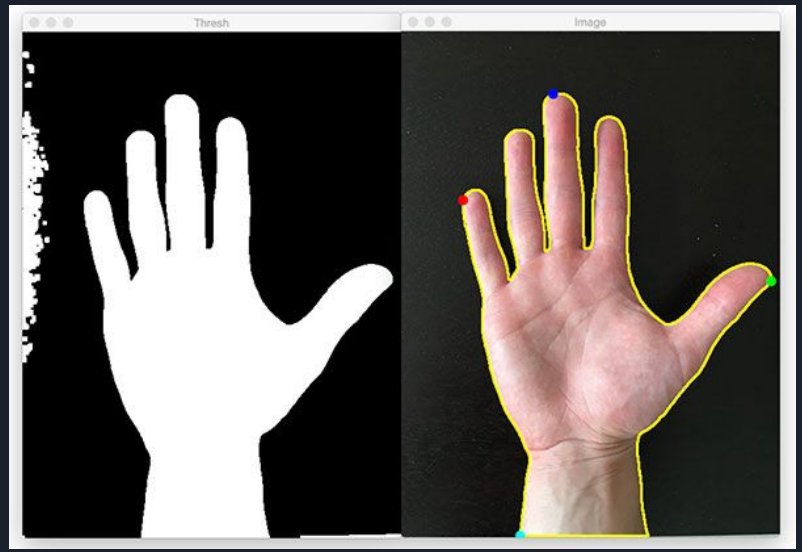
A Quick Intro To Video Tracking

Video Tracking :-

Video tracking is the process of locating a moving object (or multiple objects) over time using a camera. It has a variety of uses, some of which are: human-computer interaction, security and surveillance, video communication, augmented reality, traffic control, medical imaging and video editing.

What Are Contours?

Contours can be explained simply as a curve joining all the continuous points (along the boundary), having same color or intensity. The contours are a useful tool for shape analysis and object detection and recognition. In OpenCV, finding contours is like finding white object from black background.



Contour Features That Can Be Used In This Project.

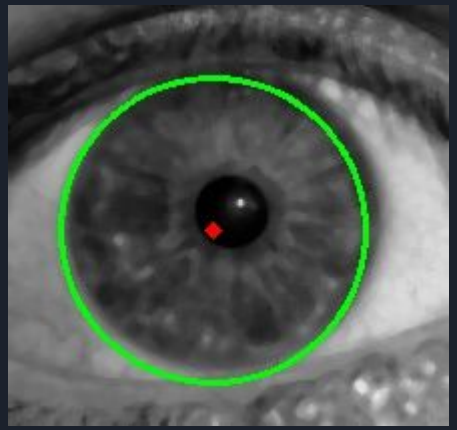
Minimum Enclosing Circle

We find the circumcircle of an object using the function cv2.minEnclosingCircle(). It is a circle which completely covers the object with minimum area.

Circle
cv2.circle()

cv2.circle() method is used to draw a circle on any image.

Syntax: cv2.circle(image, center_coordinates, radius, color, thickness)



Steps Involved In The Making

Step 1: Import the necessary libraries and initialize variables that are used.

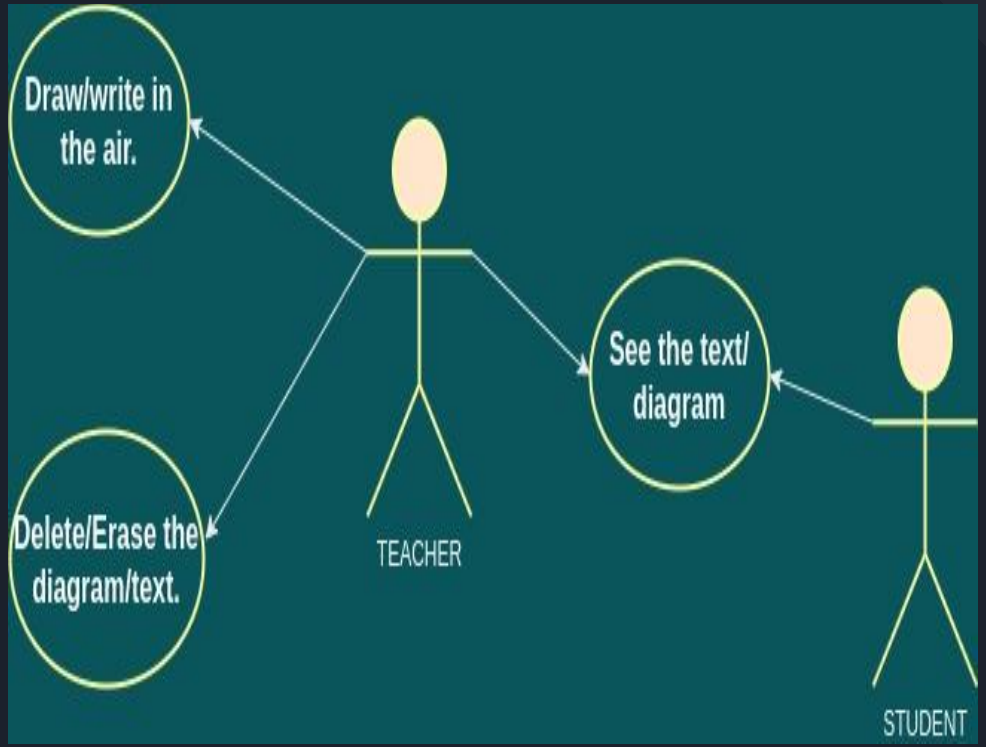
Step 2: Setup The Paint Interface.

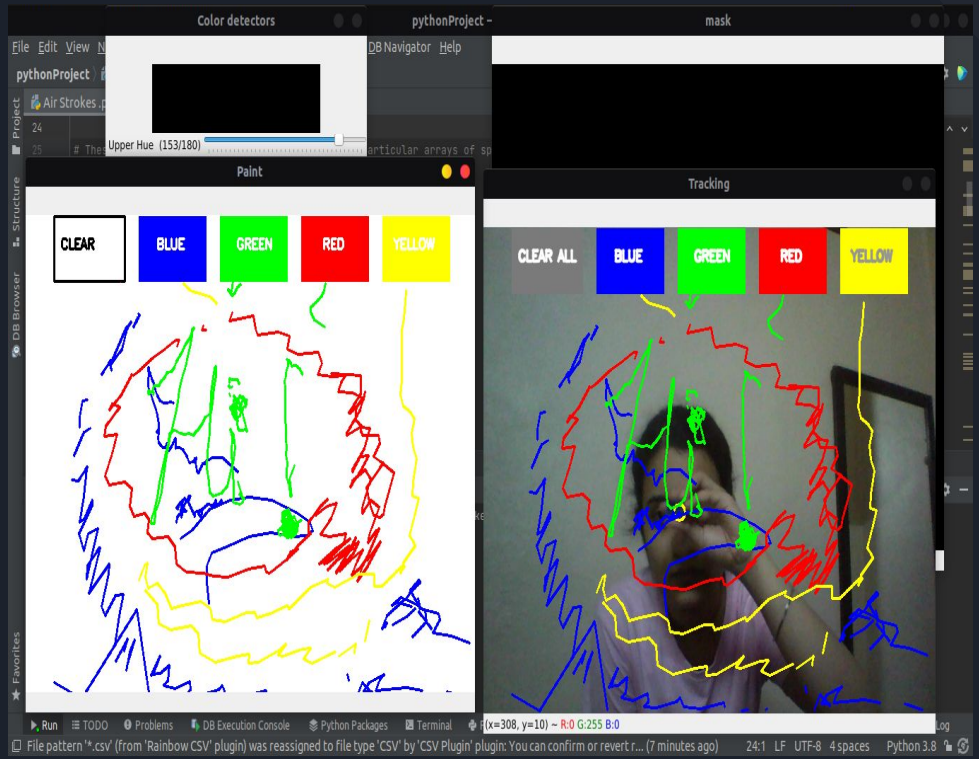
Step 3: Start Reading The Video (Frame by Frame).

Step 4: Find The Contour-Of-Interest.

Step 5: Start Drawing And Store The Drawings.

Step 6: Show The Drawings On The Screen.


Draw/write in the air.
See the text/ diagram
Delete/Erase the diagram/text.
TEACHER
STUDENT


Color detectors
pythonProject –
mask
File Edit View N
DB Navigator Help
pythonProject
Air Strokes.p
Upper Hue (153/180)
Paint
CLEAR
BLUE
GREEN
RED
YELLOW
Tracking
CLEAR ALL
BLUE
GREEN
RED
YELLOW
Run
TODO
Problems
DB Execution Console
Python Packages
Terminal
(x=308, y=10) ~ R:0 G:255 B:0
File pattern '*.csv' (from 'Rainbow CSV' plugin) was reassigned to file type 'CSV' by 'CSV Plugin' plugin: You can confirm or revert r... (7 minutes ago)
24:1 LF UTF-8 4 spaces Python 3.8

Pros and Cons

- Pros:
  - Cost effective
  - Easy to use

- Cons
  - Object of interest has to be within the specified color range
  - That specified color should not be present elsewhere in the background

THANK YOU