Real Time Writing With Fingers On Webcam

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ABSTRACT

Computer vision project implemented with OpenCV. Ever wanted to draw your imagination by just waiving your finger in air. In this we will learn to build an Air Canvas which can draw anything on it by just capturing the motion of a coloured marker with camera. Here a coloured object at tip of finger is used as the marker. This project is about the Real time writing with figure on webcam. It is the combination of Machine Learning and Computer Vision. It uses two major modules, hand tracking and writing on screen with Pre-defined objects. It is an project in the field of Machine learning and Artificial Intelligence.

Keyword : *python3, openCV, numpy, code editors, and webcam.*

1. INTRODUCTION

Internet is an innovation which made world as a global village. In early times outspread of knowledge is difficult. But now it's very easy to learn due to Internet. Internet helps education system a lot. web based learning provides a new way to learning. Different apps are now working on the concept of E-learning. In pandemic situation like covid19 it is really impossible to attend the classes physically. Now we have a solution of virtual classes for academics. But still students struggle a lot to learn through online platform.

Real time writing with fingers on webcam helps the students to understand the concepts directly through virtual blackboard. Hence by eliminating the use of actual blackboard. This by then in return saves both the time and resources.

We will be using the computer vision techniques of OpenCV to build this project. The preffered language is python due to its exhaustive libraries and easy to use syntax but understanding the basics it can be implemented in any OpenCV supported language.

Here Colour Detection and tracking is used in order to achieve the objective. The colour marker in detected and a mask is produced. It includes the further steps of morphological operations on the mask produced which are Erosion and Dilation. Erosion reduces the impurities present in the mask and dilation further restores the eroded main mask.

Traditionally in the classroom, the blackboard is used to explain the concepts and make students understand the topic, which was the easy way. But In pandemic situation like covid19 it is really impossible to attend the classes

physically. Now we have a solution of virtual classes for academics. But still students struggle a lot to learn through online platform since there is a lack of blackboard for students to understand. Here the concept of real time writing with fingers on webcam comes in handy. Since the teachers can explain the topic by directly writing on screen in an online meeting. This can also be used by organizations and companies for their meetings as well.

2. LITERATURE SURVEY

Education has grown rapidly and stimulated the adoption of e-learning, which may be a direct result of the mixing of education and technology and is deemed to be a strong medium for learning (Al-Fraihat, Joy, & Sinclair, 2017). Donna j. Abernathy said that online learning isn't subsequent big thing; it is the now big thing. E-learning has become mainstream within the education sector and has been massively adopted in education.

Real-time writing with fingers on webcam screen is an amazing program which is combination two of Hand tracking and Writing on-screen with pre-identified objects.

E-learning is a flexible platform where it removes the barriers such as, place, customs, and values of a person. E-learning gave a new dimension in today's education system to improve the standard of data. We live during a globalized era, where internet is massively getting used by everyone. Hence the sector of education trying to enhance their standards by the online which connects the space learning with their learning material. The successful implementation of e-learning tools depends on whether or not the students are willing to adopt and accept the technology. Thus, it's become imperative for practitioners and policy makers to know the factors affecting the user acceptance of web-based learning systems so as to enhance the scholars learning experience.

3. METHODOLOGY

This project is about the Real time writing with figure on webcam. It is the combination of Machine Learning and Computer Vision. It uses major modules like hand tracking and writing on screen with Pre-defined objects. It is an project in the field of Machine learning and Artificial Intelligence.

3.1 Start reading the frames and convert the captured frames to HSV colour space.(Easy for colour detection)

3.2 Prepare the canvas frame and put the respective ink buttons on it. Adjust the trackbar values for finding the mask of coloured marker.

3.3 Preprocess the mask with morphological operations.(Erotion and dilation)

3.4 Detect the contours, find the center coordinates of largest contour and keep storing them in the array for successive frames .(Arrays for drawing points on canvas)

3.5 Finally draw the points stored in array on the frames and canvas .

4. RESULTS AND DISCUSSION:

Here's the final output of our project, a web app that can write on webcam with fingers.

We have to set a specific value for specific color so that the color detector detects the color.

Color detector, it has specific values for a specific color. The values in color detector are set to capture a specific color and draw accordingly.
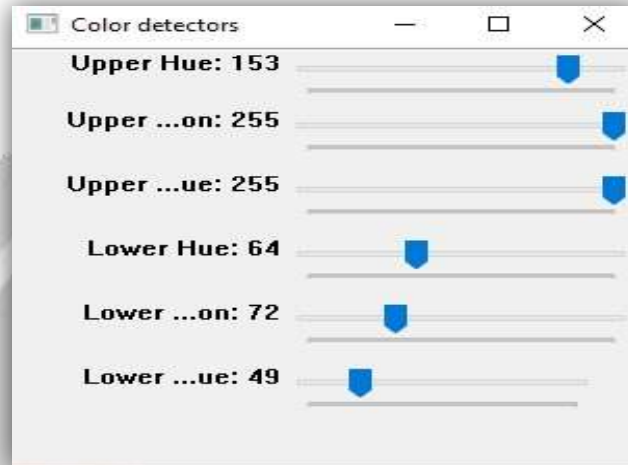

Figure 4.1: color detector

Masking, it is done to basically avoid impurities in the drawn pictures. Impurities like small dots surrounding the drawn picture. So this can create a better image quality, and avoid the blurry image.
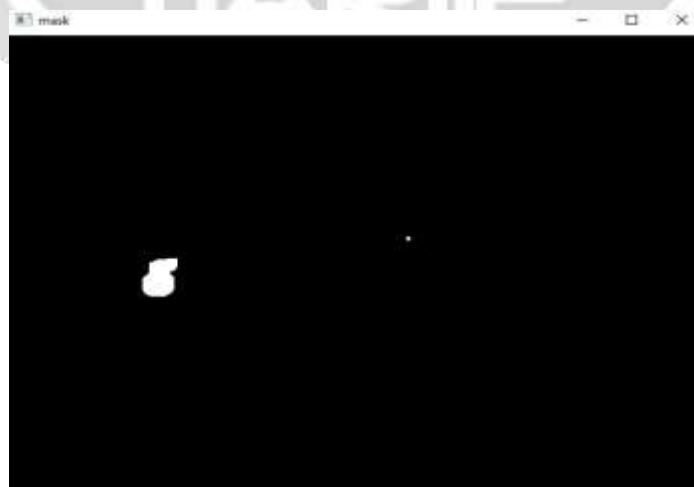

Figure 4.2: Masking

Paint window shows the drawn image in paint. It has four different colors those are Blue, Green, Red, Yellow, which can be switched among themselves by placing the pointer on them.
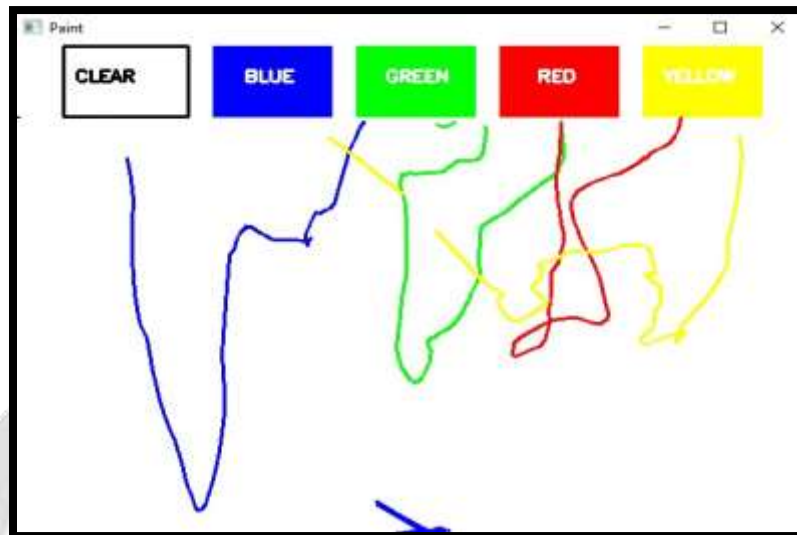

Figure 4.3: Paint window

5. CONCLUSION:

This system is just like a virtual teaching board where anyone can write with some hand gestures. It can be very useful for teachers during online classes to explain the concepts to the students easily. It is the combination of Machine Learning and Computer Vision.

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6. REFERENCES:

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