COMPUTER VISION BASED VIRTUAL SKETCH
USING OPENCV

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ABSTRACT- Virtual Sketch is in where we can draw by just capturing the motion of a colored marker with a camera. One colored object at the tip of the finger is mainly used as the marker. We are here now, using the techniques of computer vision in opencv to build this project. The required language for this project is python due to its more exhaustive libraries and easy to make use of the syntax and but understanding the basics as well as it can be implemented in any opencv supported languages The color tracking and detection processes are used to achieve the goal of this project.

Virtual Painting is a canvas-based platform on which we can draw by just motion of the hand Basically it just track the hand & capture the motion of fingers in this process the tip of the fingers are mainly used as the marker. It mainly uses is the opencv technology, which is backbone of Augmented Reality. Virtual Painting is fully developed in Python, it implements the basic and advance levels of python. The color tracking and detection process is used to achieve the output. Here the color marker is used to produce a mask on the original color canvas.

KEYWORDS: Opencv, Camera, Virtual Painting.

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1. INTRODUCTION

Sketching On Air is possible through our trending technology namely open cv, python. Open cv is mainly known as an open-source computer vision and machine learning software. The library has more than 2400 best algorithms, which includes comprehensive set of classic and state-of-the-art computer vision and machine learning algorithms. Most of these algorithms are used to detect and recognize faces, identify objects, classify human activities in videos track camera movements, track moving objects, extract 3D one's. Python is one of the high-level-general-purpose programming language. Objectoriented approach mainly to help programmers to write clear, logical code for small as well as large – scale projects. In this project we are performing the morphological operations are a set of operations that process images based on shapes. These apply a structuring element to an input image and generate an output image. Virtual AI painter using OpenCV and Mediapipe is an application that tracks the movement of an object. Using this tracking feature, the user can draw on the screen by moving the object (which in our project is the human hand) in the air, in front of the webcam. This real time webcam data generated by tracking the movement of the object helps the user to draw simple things which are both interesting and challenging. OpenCV (Open-Source Computer Vision) - is a programming language library consisting of different types of functions mainly for computer vision. To explain in a simple language or in general way it is a library used for Image Processing. It is used mainly to do all the operations which are related to Images.

Applications of OpenCV: There are lots of applications which are solved using OpenCV, some of them are listed below

face recognition

Automated inspection and surveillance

Vehicle counting on highways along with

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their speeds

Interactive art installations

Street view image stitching

Video/image search and retrieval

Object recognition

Medical image analysis

Movies – 3D structure from motion

TV Channels advertisement recognition

2.SYSTEM ANALYSIS

System Analysis is the important phase in the system development process. The System is studied to the minute details and analyzed. The system analyst plays an important role of an interrogator and dwells deep into the working of the present system. In analysis, a detailed study of these operations performed by the system and their relationships within and outside the system is done. A key question considered here is, "what must be done to solve the problem?" The system is viewed as a whole and the inputs to the system are identified. Once analysis is completed the analysts firm

understanding of what is to be done.

PROBLEM DEFINITION:

The existing system works with your fingers only, and there are no highlighters, paints, or relatives. Identifying and characterizing an object such as a finger from an RGB image without a depth sensor is a great challenge. Another problem is the lack of up and down movement of the pen. The system uses a single RGB camera to write from above. Since depth detection is not possible, the up and down activities of the pen cannot be tracked. Therefore, the entire path of the fingertip is drawn, and the resulting image would be absurd and not recognized by the model. Using real-time hand gestures to change the system from one state to another requires much code care. In addition, the user must know many movements to control his plan adequately. The project focuses on solving some critical social problems.

3.EXISTING SYSTEM:

Your screen is a device that does exactly what you are asking - it displays data. There are various ways to achieve this, one being

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the keyboard which is a traditional and widely used method to display data on the screen, it has a keyboard composed of buttons used to create letters, numbers, and symbols, and perform additional functions but it has a few disadvantages such as It is a slow method when you need to write a long piece of writing when there are faster ways such as scanning and dictation.

DISADVANTAGES OF EXISTING SYSTEM:

Difficulty with software Development - slow and Expansive.

• It is a slow method when you need to write a long piece of writing when there are faster ways such as scanning and dictation.

4. PROPOSED SYSTEM:

Drawing or Sketching using hand is everyone's wish. Some or the other time we imagine writing in air using our hand. So, here came the project from this concept where we create a canvas and pick the colors required using our hand and draw the required design or write anything you wish. Gestures are non-verbal information used to improve computer language understanding.

Human gestures are perceived via sight, and computer vision is used to research different gestures. The assignment takes gain of this shortcoming and makes a specialty of developing a motion to text converter able to serving as software for clever wearables to document from the air. The device will use computer vision to music the path of the finger, and on this manner, you will write from the top down. The generated text also can be used for extraordinary purposes, which includes sending messages, emails, etc. it is going to be a powerful approach of communique for the listening to impaired. it's far a powerful approach of communique that gets rid of the need to put in writing and reduces using cell telephones and laptops. The library has more than 2400 best algorithms, which includes comprehensive set of classic and state-of-the- art computer vision and machine learning algorithms. Most of these algorithms are used to detect and recognize faces, identify objects, classify human activities in videos track camera movements, track moving objects, extract 3D one's. Python is one of the high-level-general- purpose programming language. Object-oriented approach mainly

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to help programmers to write effectively as well as large scale.

ADVANTAGES OF PROPOSED SYSTEM:

It is an alternative for advanced teaching software, it could be used by anyone having no prior knowledge about computer, being cost effective it could be used by teachers in remote area as well for making their videos more explanatory. • Easier tracing. • Don't need a specific software.

5. HARDWARE & SOFTWARE REQUIREMENTS

HARDWAREREQUIREMENTS:
Processor: IntelDualCoreI3and above

● Hard disk: 8GBand above

● RAM: 8GBand above

● Input devices: Keyboard, mouse.

SOFTWAREREQUIREMENTS:
Software Requirements specifies the logical characteristics of each interface and software components of the system. The following are some software requirements,

● Operating system: Windows8 and above

Languages: Python

● Tools: Python IDEL3.7version,Visual Studio ,googlecolab .

6. APPROACH

Writing Hand Pose Detection Recognizing the position of the composing hand and recognizing it through other signals is an fundamental step in initializing airborne composing. Not at all like conventional writing, when the write moves down, and the write moves up, composing within the discuss isn't laid out as a writing arrangement. Events. The framework recognizes the position of a piece hand and recognizes it from a non-writing hand by tallying the number of raised fingers. Hand Region Segmentation Once we have precisely captured the hand utilizing the over procedure, the division of the hand zone is done employing a two-step approach, viz. The skin division and the subtraction of the foundation and the ultimate parallel picture of the hand are obtained as a

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conglomeration of the two.
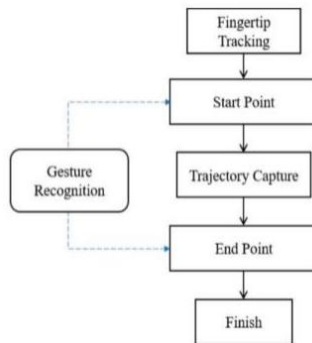
The proposed algorithm works well in real-time and gives moderately precise division. In spite of the fact that skin colors shift incredibly from breed to breed, it has been watched that skin color features a little region between distinctive skin sorts, whereas skin luminosity differs significantly.
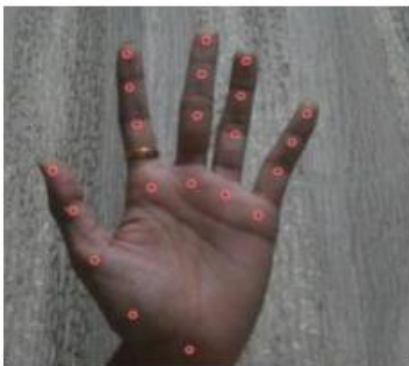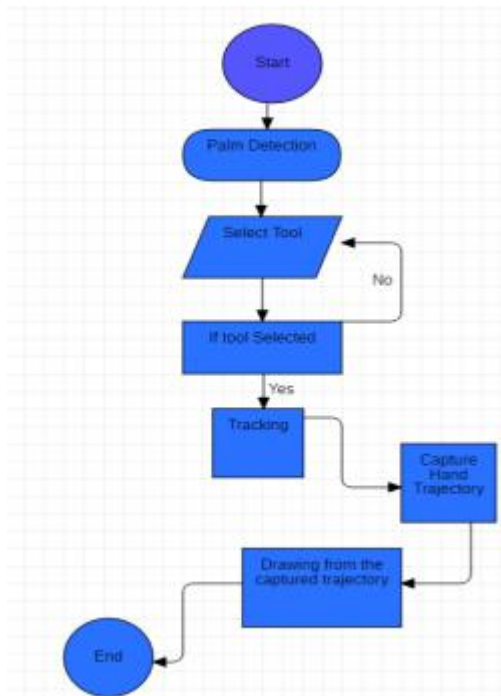

Fig: Hand Centroid Localization

Fig: Flowchart of Proposed System

7. ARCHITECTURE

PROJECT ARCHITECTURE: This project architecture shows the procedure for how the procedure done during the project

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execution

Screenshot5.6: Selecting Line from computer system

8.RESULT

Screenshot5.1: Showing the tools in computer system

Screenshot5.2: Showing hand gestures

9. CONCLUSION

This system has the potential to challenge traditional writing methods. It eradicates the need to carry a mobile phone in hand to jot down notes, providing a simple on-the-go way to do the same. It will also serve a great purpose in helping especially abled people communicate easily. Even senior citizens or people who find it difficult to use keyboards can effortlessly use the system. Extending the functionality, this system can also be used to control IoT devices shortly. Drawing

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in the air can also be made possible. This system will be an excellent software for smart wearables using which people could better interact with the digital world. Augmented reality can make text come alive. This project makes the user to have an interactive environment where the user can draw whatever he wants by choosing his required colors from the displayed ones. So, we conclude that Virtual Sketch is developed using the library NumPy and in OpenCV where we have many libraries and algorithm in built which makes the interfaces more active while using. We used python as, it have many inbuilt libraries and many modules which represent the imagination virtually when used along with OpenCV as well as its morphological processes.

10. FUTURESCOPE

This system could be used as an alternative for teaching software used by teachers. If further interpreted various virtual based physical games could be made. Controlling the robot using gestures considered as one of the interesting applications in this field proposed a system controlling a robot using

hand pose signs. The orders could be given to robot to execute some tasks, where each sign has a specific meaning and represents different function.

8. REFERENCES

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GITHUBLINK

https://github.com/197R1A0520/Computer-Vision-Based-Virtual-Sketch-Using-OpenCV

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