PYTHON MINI PROJECT

VIRTUAL PAINTING APPLICATION

USING OPENCV-PYTHON

SY COMPUTER ENGINEERING

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ABSTRACT:

Writing in air has been one of the most fascinating and challenging research areas in field of image processing and pattern recognition in the recent years.It contributes immensely to the advancement of an automation process and can improve the interface between man and machine in numerous applications By using this application we can easily draw objects,shapes by using different colours and different tools without using any mouse,keypad, we can draw it by using contact less way.In this application, it will display a screen and a canvas board, As we will keep moving our fingers over the

screen,and show the particular fingers which are given some function, the application will detect those finger movements and perform the specific task which is assigned to it.

KEYWORDS:

Virtual painting,mediapipe,digital art,handtracking,fingers counting,landmarks,IoT,canvas board.

INTRODUCTION:

In the era of digital world, traditional art of writing is being replaced by digital art. Digital art refers to forms of expression and transmission of art form with digital form. Relying on modern science and technology is the distinctive characteristics of the digital manifestation. Traditional art refers to the art form which is created before the digital art.

The traditional way includes pen and paper, chalk and board method of writing and drawing. The essential aim of digital art is of building hand gesture recognition system to write digitally.
Digital art includes many ways of writing like by using keyboard, touch-screen surface, digital pen, stylus, using electronic hand gloves, etc. But in this system, we are using hand gesture recognition

with the use of machine learning algorithm by using python programming, which creates natural interaction between man and machine.

SYSTEM METHODOLOGY and IMPLEMENTATION:

We will use computer vision to trace the path of the finger.

Here,we are going to track our hand movements and we will collect the information of the landmarks which are moving,and by keeping the record of the previously moved point and currently moving point we can draw lines between them and thus we can create a figure.

In the handTracking module, we are detecting the landmarks of our finger tips,there are total 20 landmarks of our hand,as we will keep moving our hand it will detect the position of the landmarks in the x ,y and z coordinates.

For detection we are using webcam .

After the detection of the landmarks, we will detect the movement of the specific fingers, we will detect which finger is displayed on the screen, as each finger has different id so according to that we can detect which landmark is displayed. That’s how we can count the number of fingers.

We will use this finger counting in our application.if two fingers that is pinky finger and middle finger are displayed then the selection mode will be turned on,that is in this

mode we can select different drawing tools displayed in the tool selection bar,

And when one finger that is pinky finger is displayed then the drawing mode will be turned on, in this we will be able to draw the objects,
Here the landmarklist in the handtracking module will keep a track of the path of the landmarks moved,
We will store the previously moved landmark and current landmark and later we will create a connection between those two landmarks and will draw a line between then,this is how we can create continuous lines for the moving finger tip.

For displaying the painting we have used canvas board which is made with the help of numpy,
The tool selction bar is made on the canva app and 4 different images are created,so as to show the toggling effect for the different tools.

We firstly are displaying the images on a different canvas board which will be black in color,later on if we want to display those creatures on the screen itself then we will invert the colors on the canvasboard into black and white and then we will merge the screen and canvas board and the again invert the colors to their original form.

RESULTS:

1.

so this is our screen where we are going to dislpay the drawing.

2.

these are the 20 landmarks of our hand.

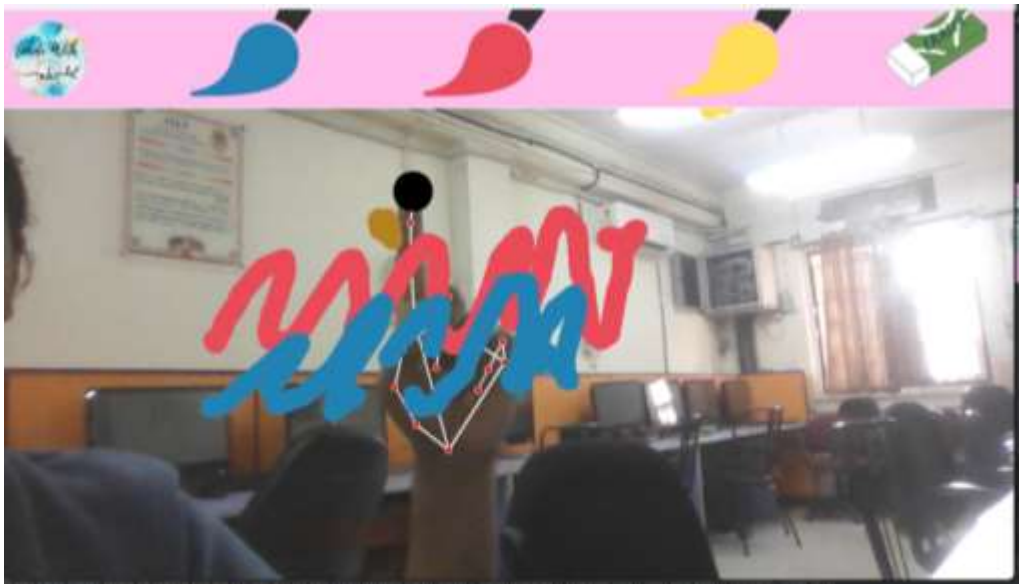
3.

after detecting the landmarks of the pinky finger,drawing mode will be activated

4.

after detecting the landmarks of the pinky finger,drawing mode will be activated

5.



this is how we can activate the multiple tools by hoveing over that side

we have also used eraser tool here.

CONCLUSION:

The system has the potential to challenge traditional drawing methods. It will also serve a great purpose in helping especially abled people to communicate easily. Even senior citizens or people who find it difficult to use keyboards will able to use system effortlessly. Extending the functionality, system can also be used to control IoT devices shortly.