Computer Vision Based Virtual Sketch Using Detection

Santosh Dhaigude¹, Sumedh Bansode², Shivam Waghmare³, Saurabh Varkhad⁴, Prof. Shubhangi Suryawanshi⁵
¹, ², ³, ⁴, ⁵Department of Computer Engineering, DR D Y Patil institute of Technology, Pimpri, Pune

Abstract: In todays world during this pandemic situation Online Learning is the only source where one could learn. Online learning makes students more curious about the knowledge and so they decide their learning path. But considering the academics as they have to pass the course or exam given, they need to take time to study, and have to be disciplined about their dedication. And there are many barriers for Online learning as well. Students are lowering their grasping power the reason for this is that each and every student was used to rely on their teacher and offline classes. Virtual writing and controlling system is challenging research areas in field of image processing and pattern recognition in the recent years. It contributes extremely to the advancement of an automation process and can improve the interface between man and machine in numerous applications. Several research works have been focusing on new techniques and methods that would reduce the processing time while providing higher recognition accuracy. Given the real time webcam data, this jambord like python application uses OpenCV library to track an object-of-interest (a human palm/finger in this case) and allows the user to draw by moving the finger, which makes it both awesome and interesting to draw simple thing.

Keyword: Detection, Hand landmark, Keypoints, Computer vision, OpenCV

I. GOALS/ OBJECTIVE

1) To create a virtual sketch.
2) To detect the human palm and finger as a color marker.
3) To create an interface between user and the system.

II. PROBLEM STATEMENT

Developing an interface between human palm and the system using open cv techniques and python language to pick the tool and draw using hand on the developed drawing area. For making teaching videos more explanatory.

III. INTRODUCTION

In the age of digital world, traditional way of art and its writing has been replaced by digital art. Digital art is evolved from traditional art means the physical ones by using techniques for creating, storing and displaying. Traditional art refers to the art form which is created before the digital art. In the present circumstances, digital art and traditional art are inclusive of the symbiotic state, so we need to systematically understand the basic knowledge of the form between digital art and traditional art. The traditional way includes pen and paper, chalk and board method of writing. The main aim of performing 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 and gloves, etc. But in our proposed system, we have used hand gesture recognition with the help of machine learning algorithm and along with python programming, for creating interaction between man and machine. With the advancement in technology, the need of development of natural human – computer interaction systems to replace traditional systems is increasing rapidly.

IV. BACKGROUND/ APPROACH

Many online learning Platform such as BYJUS, Cognitive class with help of their tutors and some technology such as graphical animation there make their videos more explanatory. In our approach we tried to make a prototype tool which would be alternative for such kind of software. Our tool would be very effective and it will enhance the online learning.

And as it would be cost effective and it could be used by any teacher to make their teaching videos much explanatory. Along with that we tried to make it more simple and user friendly and with minimum hardware requirement so that a person not having any prior knowledge about computer could use this.
V. LITERATURE REVIEW

In [1] Author proposed objects color detection and masking it with morphological operations along with that providing task bar for various color.

It is still very challenging because it is detecting only one color as marker if any other single point of color detected elsewhere it starts changing marker location and captures random trajectory.

In[2] Author is using different techniques of fingertip recognition along with that he is also creating a dataset by cutting a video into different separate images and also labelling the dataset manually further he is creating a module by training the dataset with pretrained model. But it is not that accurate.

In [3], the system proposed used the depth and color information from the Kinect sensor to detect the hand shape. As considering gesture recognition with the Kinect sensor. It is a very challenging process. Because the resolution of kinetic sensor is very low.

It is suitable for humongous object, e.g., the human body.

But for a object/thing like a finger it is not suitable.
Algorithmic Flowchart

1. START
2. Importing necessary Libraries
3. Creating a window frame with various tools for drawing
4. Capturing the video through web cam and detecting palm
5. Capturing Trajectory of Finger
6. Displaying Output
7. END
VI. ARCHITECTURE

VII. FUTURE SCOPE/WORK

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 task, where each sign has a specific meaning and represents different function.

VIII. CONCLUSION

The system has the potential to challenge traditional writing/teaching methods. The ultimate goal is to create a computer vision machine learning application that promotes Human computer interaction also named Man-Machine Interaction refers to the relation between the human and the computer or more precisely the machine. System functionality referred to the set of functions or services that the system equip is to the users while system can operate and perform specific user purposes activity efficiently such as virtual drawing.
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