

Air Canvas: Draw in Air

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Abstract- Air Canvas is developed for communicating a concept or presenting an idea in the real-world space. Air canvas makes all easy to the user. With AIR-CANVAS we present the thought of the increased reality material for data representation. This is past the customary void (white), rectangular, and level dimensional material seen in customary data representation. The venture proposed in a Python 3.6 and it utilizes the exceptionally well known OpenCV library. OpenCV is a PC vision and AI programming library that incorporates numerous normal picture examination calculations that will assist us with building custom, savvy register vision application.

Key Words - Opencv, Contour, Tracking, numpy

I. INTRODUCTION

At any point needed to draw your creative mind simply by deferring your finger in air. PC Vision is an interdisciplinary logical field that arrangements with how PCs can be made to acquire significant level comprehension by utilization of numerous computerized ways. In this undertaking we will fabricate an Air Canvas which can draw anything on it simply by catching the movement of a finger with Webcam. We will utilize the PC vision procedures of OpenCV to fabricate this task. The favored language is python because of its comprehensive libraries and simple to utilize linguistic structure however understanding the fundamentals it very well may be carried out in any OpenCV upheld language. Here Color Detection and following is utilized to accomplish the target.

- A. **Air Canvas:-** Air Canvas is a without hands computerized drawing material that uses, a camera and OpenCV to perceive and plan hand signals onto a screen.
- B. **Contour:-** Shapes may be clarified simply as a bend becoming a member of all of the consistent points (alongside the limit), having equal tone or power. The forms are a valuable instrument for shape analysis and item location and granting.

II. MOTIVATION

The underlying inspiration was a requirement for a dustless study hall for the understudies to concentrate in. I realize that there are numerous ways like touch screens and then some yet what might be said about the schools which cannot bear the cost of it to purchase such gigantic huge screens and instruct on them like a T.V. Along these lines, I thought why not can a finger be followed, however that too at an underlying level

without profound learning. Consequently it was OpenCV which acted the hero for these PC vision projects.

III. EXISTING SYSTEM

The superior pen contains of a tri pivotal accelerometer, a microcontroller, and a RF remote transmission module for detecting and amassing velocity will increase of hand composing and movement directions. Our implanted project first concentrates the time-and recurrence area highlights from the rate boom indicators and, then, at that point, sends the symptoms with the aid of using making use of RF transmitter. In beneficiary section RF symptoms may be gotten with the aid of using RF recipient and given to microcontroller. The regulator procedures the records finally then results may be proven on Graphical LCD.

IV. PROBLEM DEFINITION

Item following is considered as a significant undertaking inside the field of Computer Vision. The development of quicker PCs, accessibility of cheap and great quality camcorders and requests of robotized video investigation has given ubiquity to protest following methods. For the most part video investigation system has three significant stages: initially distinguishing of the item, besides following its development from one casing to another and ultimately breaking down the conduct of that article. Who dont needs to simply move their fingers in air and get their ideal picture.

V. LITERATURE SURVEY

- A. *Tracking of Brush Tip on Real Canvas : Silhouette-Based and Deep Ensemble Network-Based Approaches*

Author-Joolekha Bibi Joolee , Ahsan Raza, Muhammad Abdullah, Seokhee Jeon

Working-The proposed profound outfit community is ready disconnected using records stuck thru an outer tracker (Optitrack V120) and the define primarily based totally approach. During actual drawing, the organized organisation appraises the brush tip function via way of means of taking the brush deal with act like an records, allowing us to make use of actual cloth with a actual brush. During the checking out system, the framework works continuously, considering that round then, it tracks the brush deal with present (function

and direction) and the proposed profound troupe community takes this brush deal with act like information and predicts the brush tip function in genuine time. For information assortment, played out various strokes for 60 seconds on a superficial level inside the following area.

Advantages- Proposed a profound gathering network that predicts the brush tip position by taking the brush handle position and brush direction as information.

The proposed profound gathering network is fit for assessing the brush tip position with extremely less error(+1 or - 1). The created drawing by the outline based methodology using real brush tip position and profound troupe network-based methodology utilizing the anticipated brush tip is comparable to genuine drawing.

Disadvantages- Still necessities an extraordinarily adjusted edge and cameras and has inadequacy in usability. Only consider a standard size brush. System just tracks the brush handled present.

B. *Augmented Airbrush for Computer Aided Painting (CAP)*

Author-Roy Shilkrot, Pattie Maes, Joseph A. Paradiso, and Amit Zoran

Working- To work our expanded artificially glamorize, the client remains before the material, allowed to chip away at any piece of the composition, utilize any style, and counsel the PC screen in the event that the person wishes. The reference and material are lined up with an aligned focus point that relates to the virtual beginning. The client can move the gadget utilizing a coordinated strategy (testing the material, cutting it, journeying shapes, and so on), a more instinctive one (irregular strolling or nearby spotlight on a solitary region), or a blend of both. The PC will mediate just when the virtual following compares with a paint projection that disregards a virtual reference. In such a case, the PC will keep the client from utilizing the maximum capacity of the artificially glamorize trigger (see next area) and applying paint where it isn't needed. A gadget depends on a Grex Genesis.XT, a gun style digitally embellish mitigated of its back paint-volume change handle. Since this is a double activity artificially glamorize, working the trigger opens both the compelled air valve and the paint liquid valve, which is made of a needle and a spout, bringing about a stream of air blended in with paint particles. They fostered a specially crafted expansion component, to permit advanced control of the paint combination. A Grex air blower supplies compressed air at 20 PSI, and a Polhemus Fastrack attractive movement global positioning framework positions the gadget in 6DOF.

Advantages- Model can recognize overflow hazard assuming it arrives at saturation. The model incorporates custom equipment and a calculation taking into account constant trigger augmentation. The computerized artificially glamorize

permits clients to encounter the manual artwork process, with the interesting actual antiquities of the outcome. Gadget recovers realistic characteristics that supplement existing PC simulations unique results and solitary curios, addressing ongoing states of being of artificially glamorize painting. This work is an immediate augmentation of a developing arrangement of brilliant hand-held apparatuses that challenge conventional HCI standards of virtual.

Disadvantages- Since the actual model is certifiably not a total actual reenactment of the air and shade water liquids, it doesn't mimic paint shift in weather conditions or overflows. At the point when a client presses the trigger just softly while the paint liquid valve is as yet shut, a modest quantity of paint actually leaks through it.

C. *3D Drawing with Augmented Reality*

Author-Sharanya M, Sucheta Kolar, Sowmyashree B V, Sharadhi L, Bhanushree

K J

Working- A mobile application that runs on Android devices and lets the user draw on the world, treating it as a canvas, implement real-time sync of the drawing on all instances of the application running in the same network room and provide a tool for creative content producers to quickly sketch their ideas in 3D spaces. The Freehand procedure permits the client to draw constantly as coordinated by hand developments. To begin a line the client plays out the air-tap motion. The line is drawn constantly at the list cursor position until the client ends the line by playing out a subsequent air-tap.

Advantages- It provides unique techniques of presenting content and ideas. The application deals with Android utilizing the AR abilities of AR Core. It is a continuous multiplayer and permits two clients to see content at the same time and updates the new substance produced realtime.

Disadvantages- AR applications drain so much battery. The degree of accuracy of re-localizing the content placed on the world canvas can be greatly improved. Volumetric training and point cloud data classification can be added to the application.

VI. PROPOSED SYSTEM

In this proposed framework, going to utilize webcam and show unit (monitor screen). Here, will be utilizing pen or hand for drawing attractive images in front of the camera then we will attract those images, it will be shown on the presentation unit. Our mounted framework is suit for decoding time-collection pace

boom alerts into extensive thing vectors. Users can make use of the pen to compose digits or make hand motions and so on may be proven at the presentation unit.

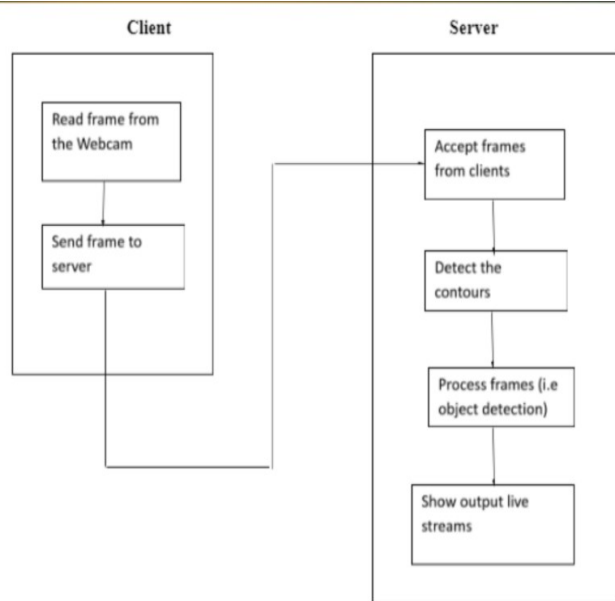


Figure No.1- Block Diagram

A. Modules of Proposed System

1. Color Tracking

Understanding the HSV (Hue , Saturation , Value) shading space for Color Tracking. Furthermore, following the little hued object at fingertip. The approaching picture from the webcam is to be changed over to the HSV shading space for recognizing the hued object at the tip of finger.

2. Trackbars

When the trackbars are arrangement, we will get the realtime esteem from the trackbars and make range. This reach is a numpy structure which is utilized to be passed in the capacity cv2.inrange(). This capacity returns the Mask on the hued object. This Mask is a high contrast picture with white pixels at the situation of the ideal tone.

3. Contour Detection

Recognizing the Position of Colored item at fingertip and shaping a circle over it. We are playing out some morphological procedure on the Mask, to make it liberated from contaminations and to distinguish shape without any problem. That is Contour Detection.

4. Frame Processing

Following the fingertip and drawing focuses at each position for air material impact. That is Frame Processing.

5. Algorithmic Optimization.

Making the code efficient to work the program without a hitch. Algorithmic Optimization.

VII. DESIGN DETAILS

We will utilize the PC vision methods of OpenCv to fabricate this venture . The favored language is Python because of its thorough librabilities and simple to utilize grammar yet understanding the fundamentals it very well may be carried out in any OpenCv support language.

A. Hardware Requirements

1. *Webcam*: A webcam is a video cam that accepts or transfers a picture or video progressively to or through a PC organization, like the Internet.
2. *Display Unit (Screen)*:- Means "Visual Display Unit." A VDU shows pictures created by a PC or other electronic gadget. The term VDU is regularly utilized interchangeably with "screen," however it can likewise allude to one more kind of show, like a computerized projector.

B. Software Requirements

- Open Cv libraries
 - Numpy
 - Python
1. *OpenCV*: It is a library of Python which is intended to tackle PC vision issues. OpenCV - Python utilizes Numpy, which is an exceptionally upgraded library. OpenCV is a friendly language to work with.
 2. *Numpy*: NumPy is the essential bundle for logical processing in Python. NumPy exhibits work with cutting edge numerical and different kinds of procedure on enormous quantities of information.
 3. *Python*: Python is a translated, object-arranged, certain level programming language with dynamic semantics. Python utilizes extremely advantageous language and assists with utilizing it easy to use .Python uses very convenient language and helps to use it user friendly.

VIII. USE CASE DIAGRAM

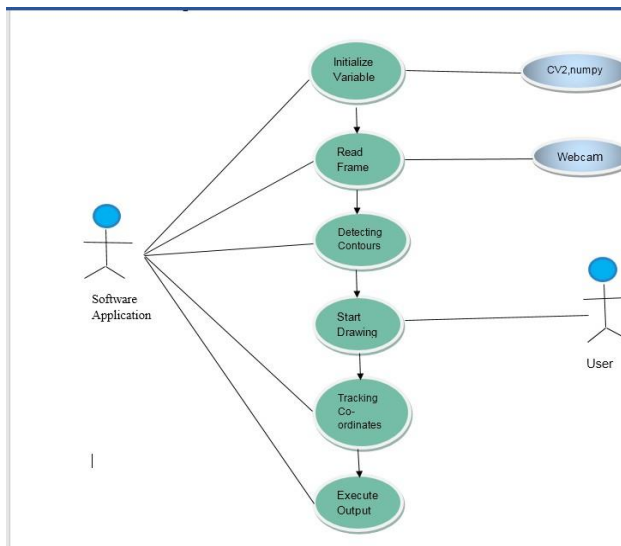


Figure No.2-Use Case Diagram

IX. ALGORITHM

- Stage 1:-** Start perusing the casings and convert the caught edges to HSV shading space (Easy for shading location).
- Stage 2:-** Prepare the material casing and put the individual ink fastens on it.
- Stage 3:-** Adjust the track bar esteems for tracking down the veil of the hued marker.
- Stage 4:-** Preprocess the veil with morphological tasks (Eroding and expansion).
- Stage 5:-** Detect the forms, observe the middle directions of biggest shape and continue to store them in the exhibit for progressive casings (Arrays for drawing focuses on material).
- Stage 6:-** Finally draw the focuses put away in an exhibit on the edges and material.

X. OBJECTIVES

- To create the mask of color object using contour detection techniques.
- Color Tracking of object at fingertip.
- To make a model for a drawing instrument that utilizations hand signal acknowledgment programming to paint/draw on a Display unit (screen).
- Mapping co-ordinates extracted from hand recognition software to produce a drawing.

- To make dustless study hall for the understudies to concentrate in.
- No compelling reason to contact the PC once the program is run.

XI. SCOPE

While there has been a blast of man-made brainpower based programming for workmanship over the most recent couple of years, people, for example, kids and the old regularly don't approach these cutting edge AI models that are right now being created. We move towards filling this hole by making an instinctive interface and application that is redone for supporting the client in their visual articulation. Clients are engaged to rapidly make different imaginative representations in a community oriented exertion between the client and the framework, and an incorporated arrangement of AI models takes into consideration a clever reaction from the framework.

XII. CONCLUSION

The undertaking Air Canvas: Draw in Air has been effectively planned and tried. It has been created by incorporating elements of all the equipment parts and programming utilized. Presence of each module has been contemplated out and set cautiously accordingly adding to the best working of the Secondly we utilized a general programming language called python, NumPy python library which working with exhibits and the assistance of developing innovation the undertaking has been effectively executed. With Air Canvas, we have accomplished a sans hands drawing program that utilizes OpenCv to recognize the clients point finger. Brilliant lines can be drawn any place the client wants. No compelling reason to contact the PC once the program is run.

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