# **Hand Gesture Paint Application**

## **Project Overview**

This project is a **Hand Gesture Paint Application** developed using **OpenCV, MediaPipe, and Python**. It allows users to draw on a canvas using hand gestures captured through the webcam. The application can recognize various gestures to switch colors and clear the canvas without any physical touch.

## **Features**

* **Draw using four colors:** Blue, Green, Red, and Yellow.
* **Switch colors using hand gestures.**
* **Clear the canvas using a dedicated gesture.**
* **Real-time hand tracking using MediaPipe.**

## **How It Works**

* The application uses the webcam to capture hand movements.
* MediaPipe is used for real-time hand tracking.
* The index finger is used as a drawing tool, and the thumb controls color selection.
* Color selection is done by pointing at the color boxes on the canvas.
* The clear button can be activated by pointing at it.

## **Installation**

### **Prerequisites**

* Python 3.x
* pip

### **Dependencies**

Make sure to install the following libraries using pip:

pip install opencv-python-headless mediapipe numpy

## **Usage**

1. Run the script using the following command:

python hand\_gesture\_paint.py

1. A window will open with a drawing canvas and color options.
2. Use your index finger to draw.
3. Change colors by pointing at the color boxes.
4. Clear the canvas by pointing at the "CLEAR" box.
5. Press 'q' to exit the application.

## **Project Structure**

* Virtual\_Paint\_Application.py: The main script containing the code.
* README.md: Project documentation.

## **Future Improvements**

* Add support for more colors.
* Implement shape drawing (circle, rectangle) using gestures.
* Optimize hand tracking for smoother drawing.

## **License**

This project is open-source and free to use under the **MIT License**.