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VOLUME AND BRIGHTNESS CONTROL USING HAND GESTURES

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Abstract: We are developing a volume and brightness controller in which we are using hand gestures as the input to control the system,Opencv module is basically used in this implementation to control the gesture. Hand gesture recognition system has developed excessively in the recent years, reason being its ability to cooperate with machine successfully. Gestures are considered as the most natural way for communication among human and PCs in virtual framework. We often use hand gestures to convey something as it is non-verbal communication which is free of expression. In our system, we used background subtraction to extract hand region. In this application, our PC's camera records a live video, from which a preview is taken with the assistance of its functionalities or activities. This system basically uses the web camera to record or capture the images /videos and accordingly on the basis of the input, the volume and brightness of the system is controlled by this application. The main function is to increase and decrease the volume and brightness of the system. The project is implemented using Python, OpenCV.

I. INTRODUCTION

Hand gestures are unprompted and also robust transmission mode for Human Computer Interaction (HCI). Keyboard, mouse, joystick or touch screen are some input devices for connection with the computer but they don't provide appropriate interface whereas, the current system will contain either desktop or laptop interface in which hand gesture can be done by wearing data gloves or web camera used for snapping hand image. The first step towards this gesture recognition is hand capturing and analyzing. Sensors are used in Data-Glove methods for initializing fingers movement and other sennsor will program hand movements. In comparison the vision-based method only needs a camera and hence identifying the actual interaction between human and computer without using any other devices. The challenges of this system are constant background, sometimes person and lighting also. Different procedure and algorithms which are used in this system are elaborated here along with the recognition techniques. The method of searching a connecting region in the picture with particular specification, being it color or intensity, where a pattern and algorithm is adjustable is known as segmentation. Vision Based method requires a web camera, so that one can realize natural interaction between humans and computer without using any other devices. The challenging part in these systems is background images or videos which is recorded or captured during taking the inputs i.e. hand gesture by the user, also sometime lightning effect the quality of the input taken which creates the problem in recognizing the gestures. Process to find a connected region within the image with some of the property such as color ,intensity and a relationship between pixels i.e. pattern is termed as segmentation. And have used some important packages which have OpenCvpython, tensorflow, numpy, mediapipe, imutils, scipy, numpy

II. LITERATURE SURVEY

S. No	AUTHORNAME	PROBLEMS IDENTIFIED	TECHNIQUES USED	ACCURACY	DRAWBAC KS
1.	Mahmoud E and Bernd M	To Recognize the Isolated and Meaningful Hand Gesture	Hidden Markov Model	93.84	It is having high Computational consuming
2.	Hasan	Gesture Recognition based on brightness factor matching	Trimming and Scaling Normalization Technique	95%	It uses the complete frame or complete web cam.
3	Robust	Gesture recognition for robotic control	Dynamic Gesture recognition	93.2%	Using lowest pixels cameras

III. FLOW

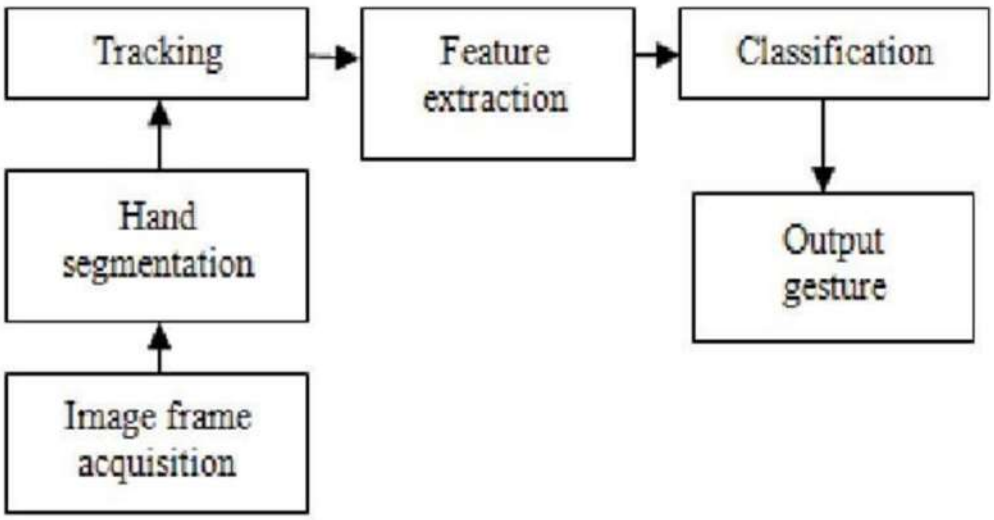

Fig-FLOW OF THE PROJECT

USE CASE DIAGRAM

A use case diagram in the Unified Modeling Language (UML) is a type of behavioral diagram defined by and created from a Use-case analysis. Its purpose is to present a graphical overview of the functionality provided by a system in terms of actors, their goals (represented as use cases), and any dependencies between those use cases.

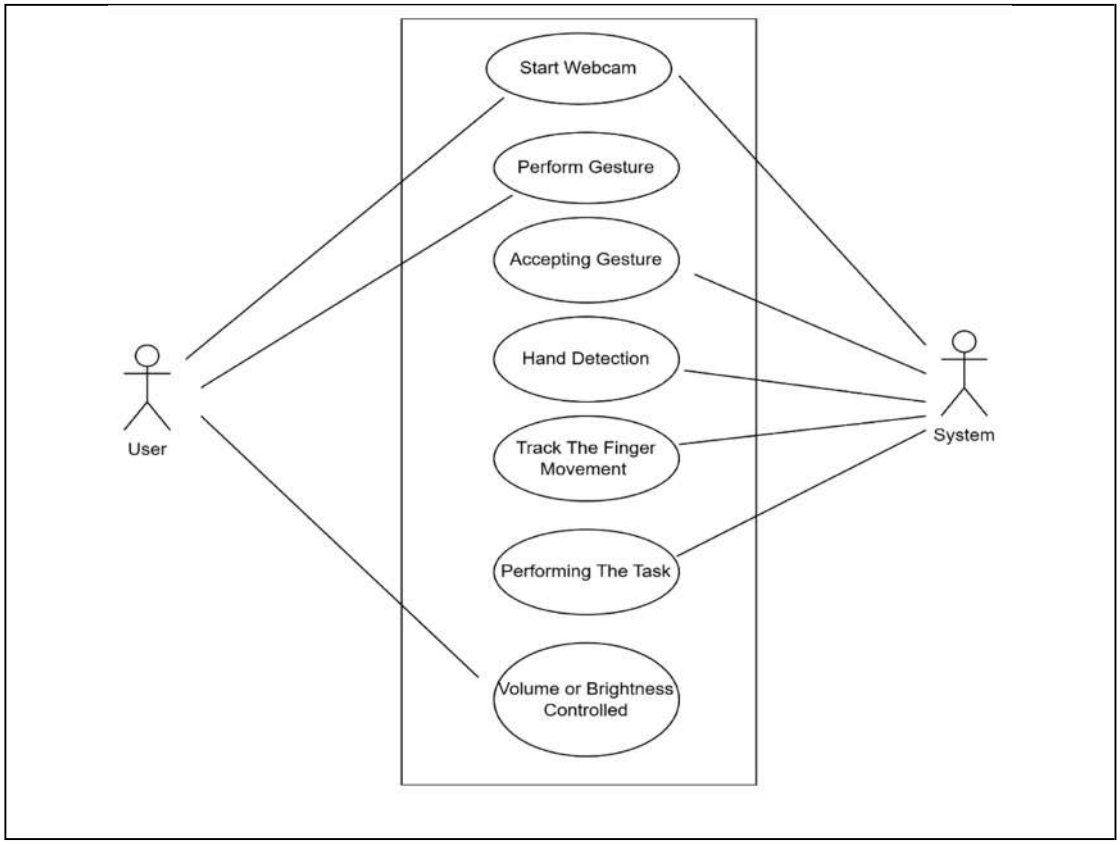

Fig-USE CASE DIAGRAM

CLASS DIAGRAM

In software engineering, a class diagram in the Unified Modeling Language (UML) is a type of static structure diagram that describes the structure of a system by showing the system's classes, their attributes, operations (or methods), and the relationships among the classes. It explains which class contains which information.

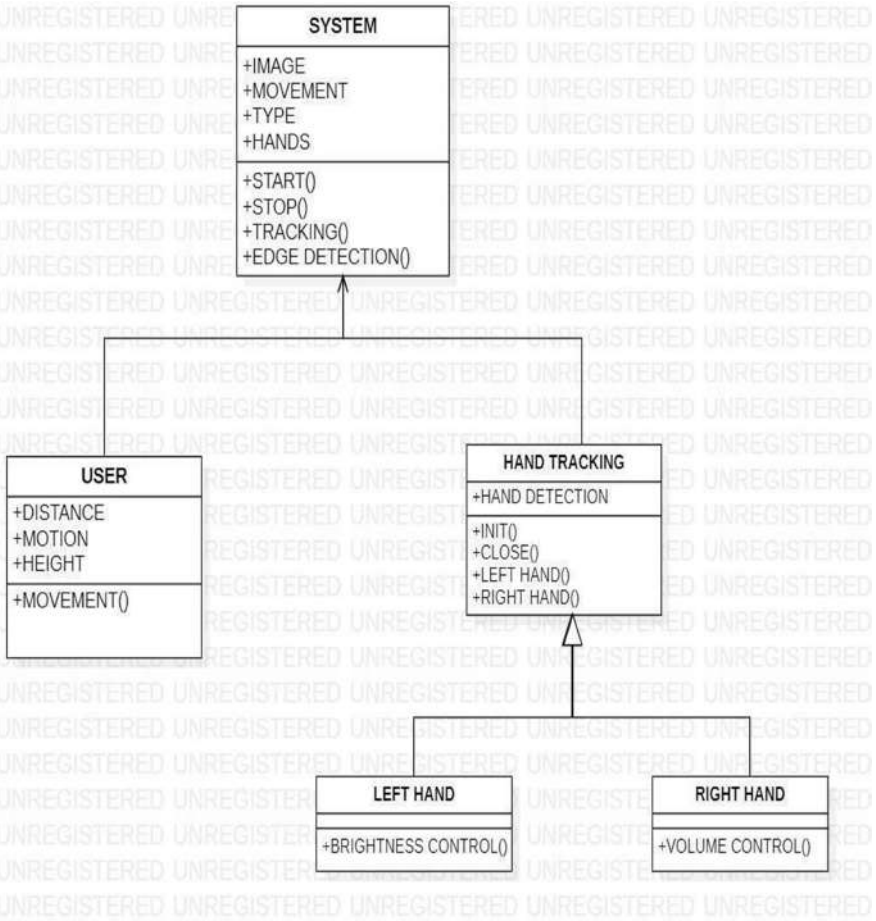

Fig-CLASS DIAGRAM

SEQUENCE DIAGRAM

A sequence diagram in Unified Modeling Language (UML) is a kind of interaction diagram that shows how processes operate with one another and in what order. It is a construct of a Message Sequence Chart. Sequence diagrams are sometimes called event diagrams, event scenarios, and timing diagrams.

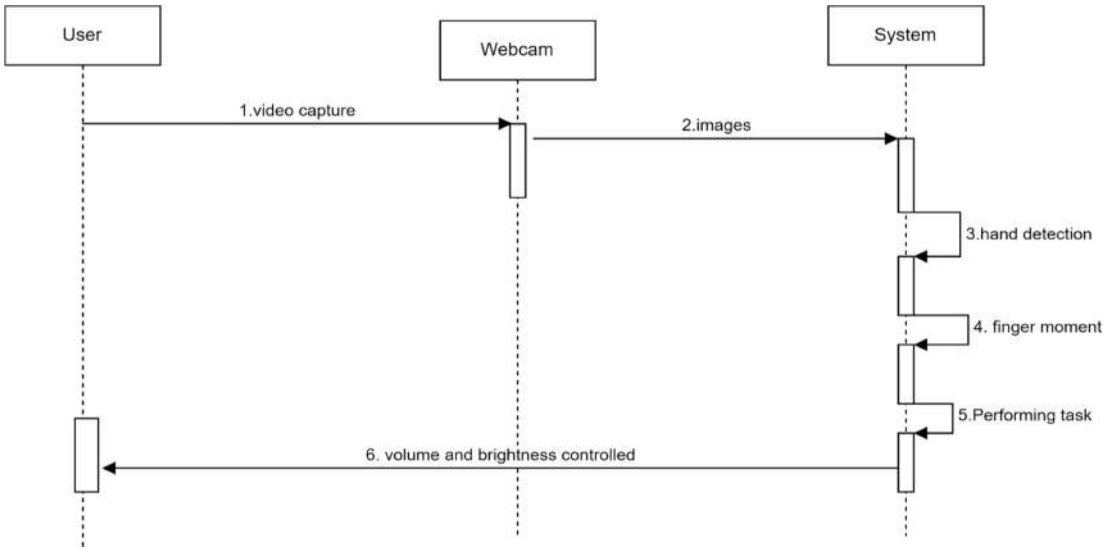

Fig-SEQUENCE DIAGRAM

ACTIVITY DIAGRAM

Activity diagrams are graphical representations of workflows of stepwise activities and actions with support for choice, iteration and concurrency. In the Unified Modelling Language, activity diagrams can be used to describe the business and operational stepbystep workflows of components in a system. An activity diagram shows the overall flow of control.

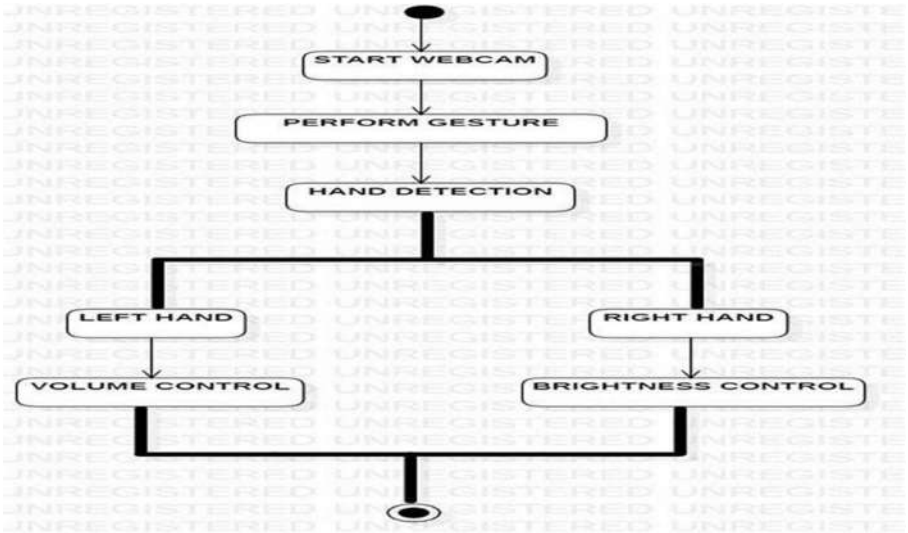

Fig-ACTIVITY DIAGARM

IV. OUTPUT SCREEN

CONTROLLING VOLUME WITH LEFT HAND(MIN):

When the thumb and index fingers distance is minimum the volume is minimum

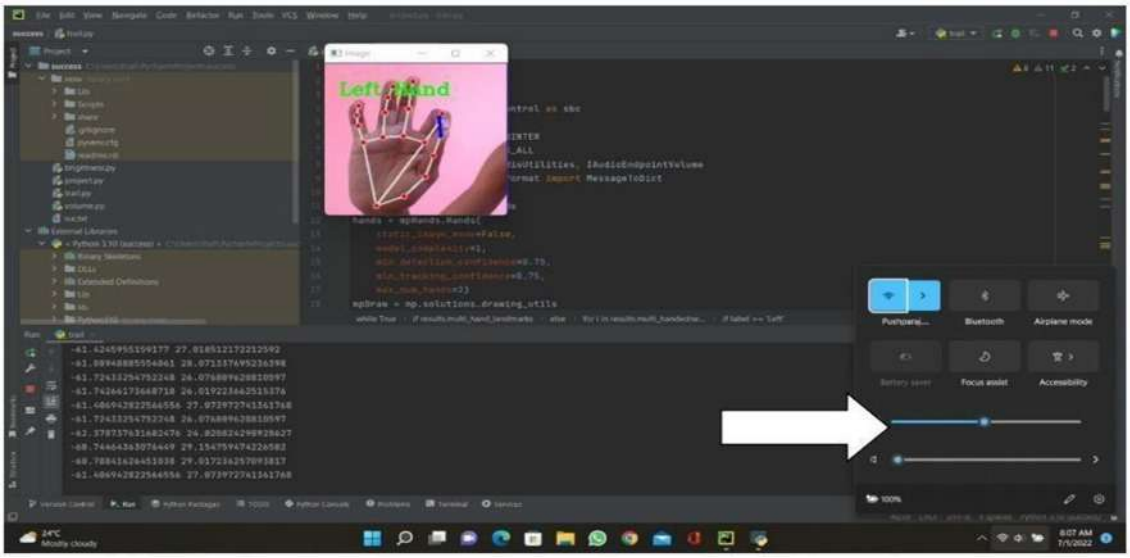

FIG-8.1 RIGHT HAND

CONTROLLING VOLUME WITH LEFT HAND(MAX):

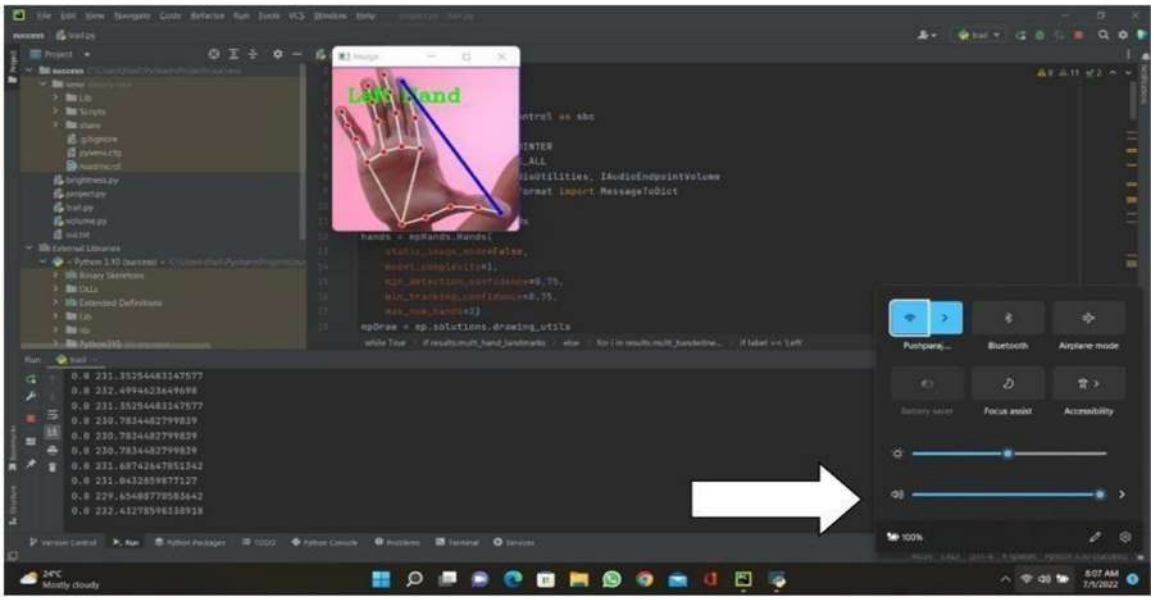

FIG-LEFT HAND

CONTROLLING VOLUME WITH LEFT HAND:

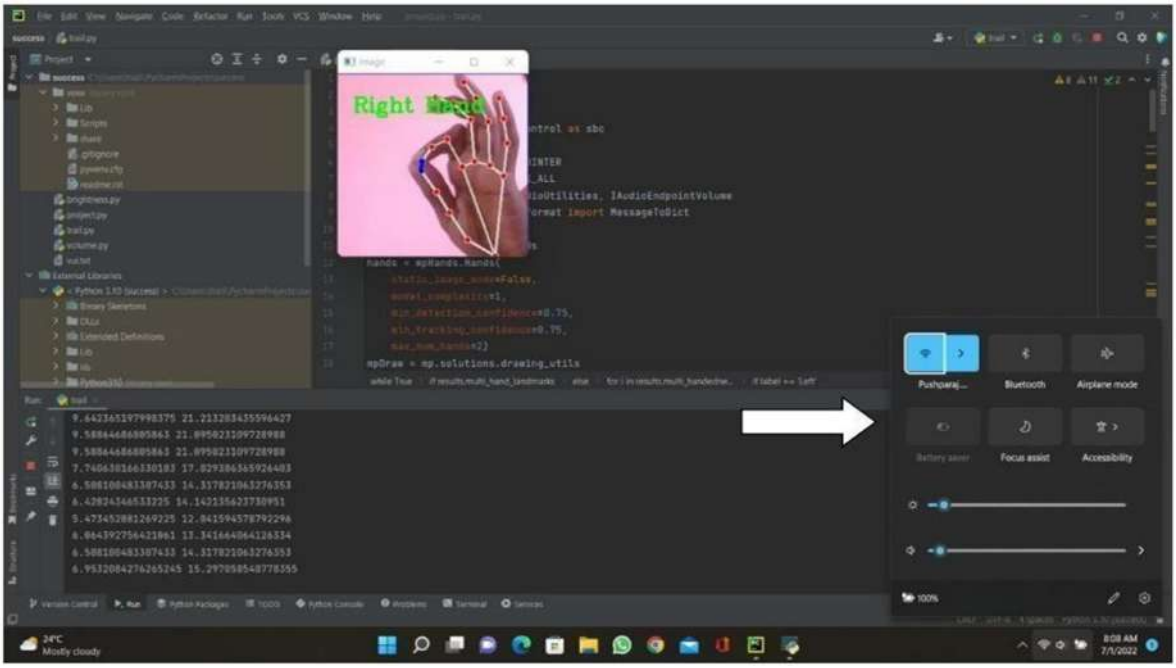

FIG-DATA COLLECTION PAGE

CONCLUSION

The project presented a program that allowed user to perform hand gestures for easy software control. A vision-based hand Gesture system that does not require many special markers or gloves and can operate in real-time on a commodity PC with low-cost cameras. Specifically, the system can track the tip positions of the counters and index finger for each hand. The motivation for this hand Gesture was a desktop-based Hand gesture analysis can be divided into two main approaches, namely, glove-based analysis, vision-based analysis. The glovebased approach employs sensors (mechanical or optical) attached to a glove that acts as transducer of finger flexion into electrical signals to determine hand posture.

1. REFERENCE

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