IPEC Journal of Science & Technology, Vol. 01 (02), Oct. 2022
ISSN: 2583-3286(Online)

Controlling Mouse Movements using Hand Gestures

Shashwat Gupta, Shivam Sharma, Suhana Sharma, Tannu Sharma, Medhavi Bhardwaj
Department of Information Technology, Inderprastha Engineering College, Ghaziabad, Uttar Pradesh, India

Abstract: **Inverters play a major role in electrical field and there have been much advancement in this context. Multilevel inverter is one among them. This study proposes a single phase seventeen level multilevel inverter. Here the dc sources will be coupled in a series/parallel configuration to distribute the load. A couple of switches and voltage sources will be used for producing a larger number of output level voltages. The harmonic content will be reduced by using the technique of hybrid modulation. Comparison in THD value is done for thirteen level and seventeen level topology and THD value improvement can be seen here. The simulation of the inverter is carried out in SIMULINK.**

Keywords-Hybrid modulation, Hybrid Modulation, Multilevel Inverter,

I. INTRODUCTION

Hand gestures are the most effective and suggestive form of mortal communication, and they're an extensively understood language. It's sufficiently suggestive to allow the deaf and dumb to comprehend it. A real- time hand gesture system is suggested in this paper. The system's experimental configuration combines a fixed position low- cost web camera with high- description recording function installed on the top of a computer display or a fixed camera on a laptop to collect shots in the Red Green Blue (RGB) colour space from a distance. Image pre-processing, region birth, point birth, and point matching are the four ways of this design. One of the primary challenges in communicating with eyeless and deaf people is the recognition and understanding of sign language.

Grounded on pre-processing, background junking, and edge discovery approaches, an effective hand gesture segmentation methodology has been suggested in this study. Pre-processing is the process of preparing data for a posterior process. The abecedarian thing of the pre-processing step is to convert the data into a format that can be reused more snappily and fluently. Pre-processing approaches are developed in the proposed work grounded on colourful feathers of combinations from following hand gesture image processing operations similar as picture prisoner, noise junking, background deduction, and edge recognition, and these image processing styles are presented as follows.

originally, film land of hand movements is acquired using a vision- grounded camera. Hand gestures may be detected via colorful interfaces like gloves, which bear the stoner to wear trackers or gloves. Generally, glove- grounded interfaces need the stoner to be attached to the computer, reducing the quantum of trouble spent on stoner comfort and interface; whereas, vision- grounded interfaces allow for unrestricted mortal engagement.

Authors want to develop a free hand recognition program for laptops and PCs with webcam capability using this exploration. The design includes a hand recognition tool that may be used to move the mouse pointer, conduct simple operations similar as moving the cursor, and other gesture conditioning similar as volume control.

II. PREVIOUS RESEARCH

The current system comprises a general mouse- grounded examiner control system and the lack of a hand gesture system [1-3]. Remote access to the examiner screen through hand gestures isn't possible. Indeed though it's primarily trying to apply, the breadth is simply limited in the virtual mouse area. The present virtual mouse control system comprises simple mouse operations exercising a hand recognition system, in which users may control the mouse pointer, left click, right click, drag, and so on [4-8]. The operation of hand recognition in the future won't be used. Despite the fact that there are a variety of systems for hand recognition, the system they used is stationary hand recognition, which is simply recognition of the shape made by the hand and the description of an action for each shape made, which is limited to a many defined conduct and causes a lot of confusion.

III. PROPOSED SYSTEM

Indeed, if there are a variety of fast access ways for the hand and mouse gesture for laptops in the system, the laptop or webcam can be used by detecting the hand gesture with our result. Operate the mouse and execute simple operations similar as opting and declining particulars using the left click. The completed design is a" Zero Cost" laptop hand identification system that use introductory algorithms to descry the hand, hand movements, and assign an action to each movement. still, substantially concentrated on mouse pointing and clicking. The system are erecting, which is written in Python, will be much more responsive and easy to

Date of Submission: 01 June 2022

Accepted on 15 September 2022

Corresponding Author:ShivamSharma
(Email: urmail4shivam@gmail.com)

ISSN: 2583-3286(Online)

apply because Python is a simple language that's platform independent, flexible, and movable , all of which are desirable rates in a program aimed at creating a Virtual Mouse and Hand Recognition system. By specifying conduct for the hand movement for doing a given exertion, the system becomes much further expandable. It might be farther customized by adding similar conduct for the set of hand movements; only your imagination limits the possibilities.

IV. METHODOLOGY

In the Methodology, the system used in each element of the system will be explained independently. There are following subsections

1. Camera Settings

The camera on the linked laptop or desktop controls the runtime conduct. A videotape Capture object is needed to capture a videotape. The device indicator or the name of a videotape train can be used as a parameter. The device indicator is just a number that identifies which camera is being used. By pass it as' 0' because only one camera will be in use. . For adding further cameras to the system and assign those figures like, and so on. After that, it may capture each frame collectively. But do not forget to release the prisoner at the conclusion. By making minor changes to the algorithm, it can apply color discovery ways to any image.

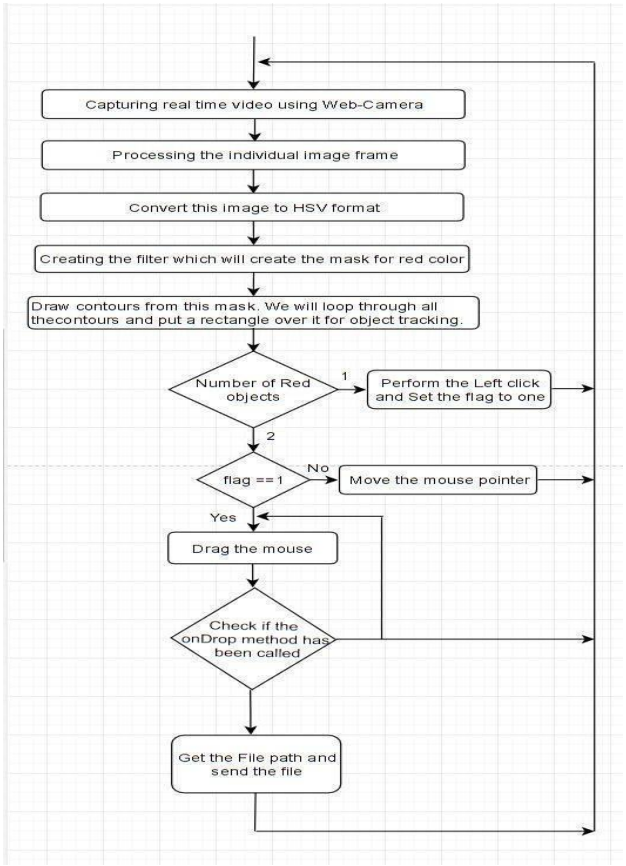

Figure 1: Flowchart

2. Capturing frames

The endless circle is used to insure that the web camera catches the frames at all times and remains open throughout the program. Frame by frame, can capture the live broadcast sluice. also each collected frame in the RGB(dereliction) colour system is converted to HSV colour format. In Open CV, there are further than 150 colour- space conversion algorithms. But here simply examine two of the most common bones BGR to Grey and BGR to HSV..

3. Masking technique

The mask is principally creating some specific region of the image following certain rules. Then created a mask that comprises an object in red colour. After that perform a bitwise AND operation on the Input image and the Threshold image, which affect in only the red multi-colour objects being stressed. This result of the AND operation is stored in res and display the frame, res and mask on 3 separate windows using imshow() function.

4. Display the frame

The imShow() is a function of High Gui and it's needed to call the wait Key regularly. The processing of the event circle of the imshow() function is done by calling waitKey. The function wait Key() delays for a crucial event for a " detention "(then, 5 milliseconds). Windows events like redraw, resizing, input events etc. are reused by High Gui. So it call the waitKey function, indeed with a 1ms detention.

5. Mouse Movement

First calculate the centre of both detected red objects which can fluently do by taking the normal of the bounding boxes maximum and minimal points. Now get 2 co-ordinates from the centre of the 2 objects. It will find the normal of that and will get the red point shown in the image. Converting the detected match from camera resolution to the factual screen resolution. After that set the position as the mouse position. but to move the mouse pointer it'll take time. So, to stay till the mouse pointer reaches that point. So started a circle, just staying for the current mouse position to be the same as the assigned mouse position. That's for the open gesture.

6. Clicking

The coming step is to apply the close gesture. The operation is performed by clicking the object and dragging it. It's analogous to the open gesture, but the difference is only have one object then so only need to calculate the centre of it. And that will be placed on the position where there will be place mouse pointer rather than a mouse release operation to perform a mouse press operation.

7. Drag

In order to apply the dragging we introduce a variable 'pinch flag'. It'll be set to 1 if it was clicked before. So after clicking

ISSN: 2583-3286(Online)

find the open gesture, check if the pinch flag is set to 1. If it's set to one also Drag operation is performed else the mouse move operation is performed.

V. RESULT AND EVALUATION

In this paper, efforts are made to focus on helping cases who do not have control of their branches and also extemporize the commerce between the machine and humans. Main motive was to produce this technology in the cheapest possible way and also to produce it under a standardized operating system.
The proposed system controls the functions of the mouse pointer by detecting the hand and performing the mouse functions similar to left click, dragging, and cursor movement. This system detects the red colour objects for the mouse control. The stoner uses the red colour objects on their cutlet tip for better performance. It also performs simple mouse movement actions when the number of images is two. Otherwise, it also does a left click when the number of photographs is one. This system is substantially aimed to reduce the use of tackle factors attached with the computer. Although the operation can be run in an ordinary computer having a web camera, but immaculately it requires having at least 2MP front camera with at least Pentium processor and at least 256 MB RAM. It can be seen these all operations on the following images;

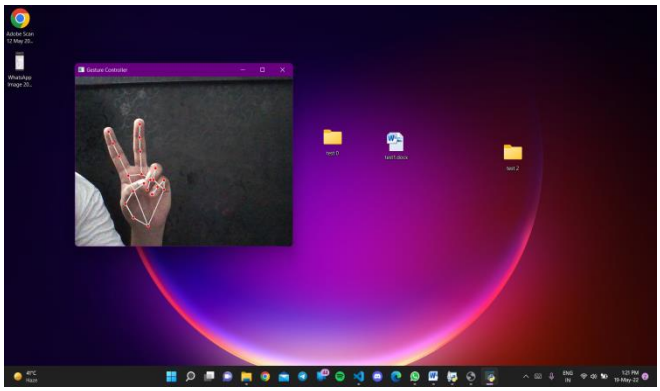

Figure2 : Moving the mouse pointer

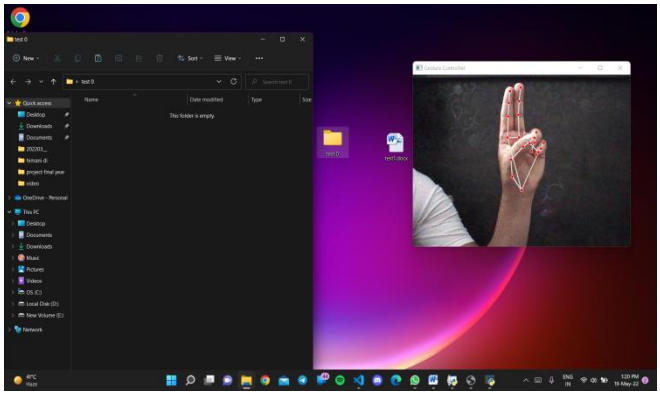

Figure3 : Performing mouse click

VI. CONCLUSIONS

Gesture recognition gives the best interaction between human and machine. Gesture recognition is also important for developing alternative human computer interaction modalities. It enables humans to interface with machines in a more natural way. Gesture recognition can be used for many applications like sign language recognition for deaf and dumb people, robot control etc. The usage of hand recognition in the future will not be used. Despite the fact that there are a variety of systems for hand recognition, the system they used is static hand recognition, which is simply recognition of the shape made by the hand and the definition of an action for each shape made, which is limited to a few defined actions and causes a lot of confusion.

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