

Mouse Simulation Using a Single Color Tape

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ABSTRACT

One of the significant difficulties in Human Computer Interactions is to foster more instinctive and more normal interfaces. Processing conditions as of now are emphatically attached to the accessibility of a high goal pointing gadget with a solitary, discrete two dimensional cursor. Present day Graphical UI (GUI), which is a current standard interface on (PCs), is distinct, and it's anything but a proficient interface for a client to utilize different applications on a PC. GUIs (graphical UIs) joined with gadgets, for example, mice and track cushions are very viable at lessening the wealth and assortment of human correspondence down to a solitary point. While the utility of such gadgets in the present interfaces can't be denied, there are numerous clients who track down that the ability of GUI is fairly restricted when they attempt to do a few undertakings by utilizing motions. There are freedoms to apply different sorts of sensors and strategies to advance the client experience of such clients. For instance, camcorders and PC vision procedures might be utilized to catch numerous subtleties of human shape and development. The state of the hand might be examined after some time to control an onscreen object in a manner undifferentiated from the hand's control of paper on a work area. Such a methodology may prompt a quicker, more normal, and more liquid style of cooperation for specific undertakings.

Keyword- *Simulation, D noise, Grayscale, and etc.....*

1. Hand gesture Recognition

The last advance is utilize the hand form to perform hand signal acknowledgment. Some well-known strategies for hand signal acknowledgment are Hough circle change utilized by (Burns and Mazzarino 2006), Template Matching utilized by (Hasan and Mishra 2012) what's more, convexity absconds utilized by (Manresa and Cristina 2005). The principle issue with Hough Circle Transform is that each point along the form border should be examined to decide whether it's anything but a circle with different focuses in the shape. This causes the Hough to change technique exceptionally lethargic and CPU serious, hence it was not utilized in the proposed strategy. Layout Matching in the OpenCV library (cvMatchTemplate) utilizes Hu Moments to contrast one shape or form and another. This right away presents a limit to such an extent that an AI classifier should be utilized with this strategy to give exact outcomes. This is because of the unavoidable commotions in the picture, which would cause varieties looking like the form. Since the Match Template technique utilizes one shape as the format and thinks about different shapes to the layout, then, at that point utilizing a classifier would permit numerous shapes to be utilized as the layout. The Match Template technique with a SVM classifier was utilized by (Georganas 2011). The analysts tracked down that the precision of motion acknowledgment relies vigorously upon the measure of preparing tests utilized in the classifier. Because of time requirement for the project, it would have taken long to create and prepare a classifier, subsequently the Template Coordinating with technique was not utilized in the strategy attempted in this investigation.

1.1 Hand Recognition and Colour Tape Detection

The initial step of our framework is to isolate the potential hand pixels from the non-hand pixels. This should be possible by foundation deduction plot which fragments any potential closer view hand data from the non-changing foundation scene. At the framework startup, a couple of foundation pictures is caught to address the static workspace from camera see. Ensuing outlines then, at that point utilize the fitting foundation picture to portion out moving frontal area information. After foundation deduction, the cycle of skin division is finished. Here, a histogram-based skin classifier appoints every one of the RGB pixels in the preparation set to either a

3D skin histogram or non-skin histogram. Given these histograms, the likelihood is registered that a given RGB tone has a place with the skin or

non-skin classes. The skin division measure yields a picture which is prepared for recognition of shading tapes in the finger. For this a calculation dependent on HSV shading space is utilized which is extremely compelling to choose a certain shading out of a picture. The thought is to change over the RGB pixels into the HSV shading plane, so that it is less influenced to varieties in shades of comparable shading. Then, at that point, a resistance veil is utilized over the changed over picture in the immersion and shade plane. The subsequent parallel picture is then run through a convolution stage to lessen the commotion presented

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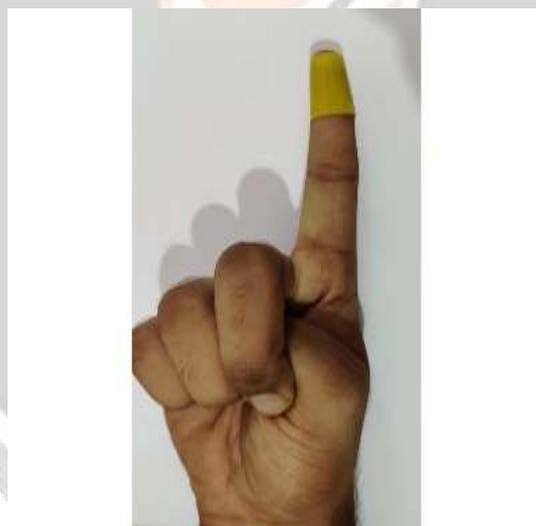


Fig 1: Yellow tape for cursor movement

1.3 Mouse Cursor Movement

We are utilizing the pointer n thumb with yellow shading tape as a cursor regulator to control mouse cursor development. Two unique methodologies for moving the mouse cursor can be utilized. The primary strategy is position planning the forefinger on a camera screen to a work area screen position. Be that as it may, this strategy brings about an issue. On the off chance that the goal of the work area window is more prominent than the camera goal, then, at that point the cursor position can't be precise on the grounds that while changing camera goal over to the work area window goal, middle qualities are lost. The normal proportion of bouncing pixel is up to 4 pixels. The subsequent technique is known as weighted speed cursor control. Here the distinction of the finger of the current picture and the past picture is found and the distance between the two is figured. Then, the mouse cursor is moves quick if the hole between the two finger pictures (current and past outline) is far or, on the off chance that the hole is close, the cursor moves moderate. There is an issue related with this calculation moreover. A few machines which can't accomplish picture preparing under 15 fps don't work easily on the grounds that processing the picture community and the hand shape sets aside time. first strategy which utilizes supreme situation of fingertips since it is more precise than the subsequent technique

1.4 Left Click

At the very first step, the system records the distance (say D) between the yellow and red tapes in the index finger and the thumb respectively. Here, the index and thumb must be apart as much as possible so as to get maximum distance. This distance is regarded as the threshold distance for the event. Now, as the thumb moves towards the index finger, the distance between the finger tips or in other words, the distance between yellow and red tapes is decreases. In the second step, when the thumb is close to the index finger the system records the reduced distance (say D') between them. When the distance between the tapes is reduced to D' or less we consider the event as the left click event of the mouse cursor.

Thus mathematically, $D' < D$

Suppose the distance between the tapes at any time is d then for

left click event

$$d \leq D'$$

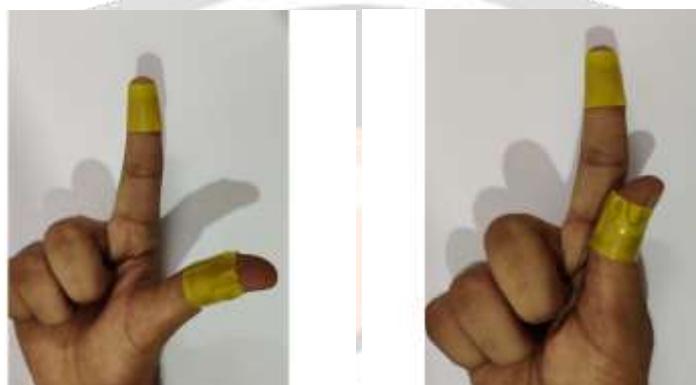


Fig 2:
Initialization of
Reduced distance

Fig 3:
Threshold distance

1.5 Right Click

The right click event of the cursor is simulated using the concept of waiting time. If the yellow tape on the index finger is waiting for 5 seconds (say) in front of the camera pointing at the same location, then the event is recognised as the right click event of the mouse cursor. Here, the distance between the red and yellow tapes should be between D and D' respectively. The required hand gesture is depicted in Figure: 3.

Thus, for right click event

$$D' < d \leq D$$

Waiting time = 5 sec.

1.6 Double Click

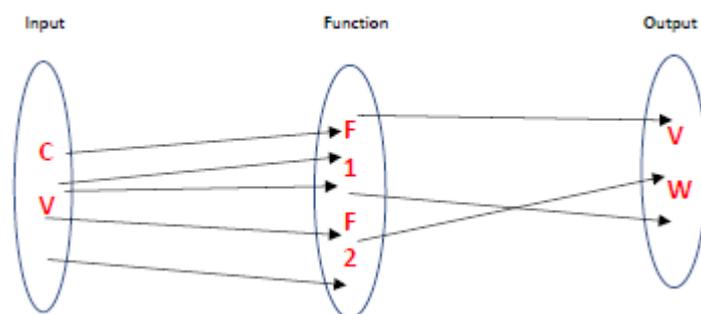
The double click event of the cursor is also simulated in the same way as the right click event considering the waiting time. The only difference is that the finger gesture used for double click is as shown in Figure: 4. If both the colour tapes are waiting for the time 5 seconds (say) and the distance between the colour tapes is D' (reduced distance) or less then the event is recognised as double click event of the mouse cursor.

Thus, for double click event

$$d \leq D'$$

Waiting time = 5 sec.

2. Design of Project



Condition: Background should be of stable color such that this color should not be present on fingers.

Use Case Description

There are four actors in the use case. First actor is User which gives input to the web camera. That inputs are nothing but different hand gestures. Second actor is Web camera which captures the inputs from user and gives these frames to the system. Third actor is system which performs mapping between users input and different actions(left click, right click, scrolling etc.) which are to be performed on the screen. Fourth actor is screen on which actual mouse movement will take place.

4. CONCLUSIONS

The system that we have proposed will completely revolutionize the way people would use the computer system. Presently, the webcam, microphone and mouse are an integral part of the computer system. Our product which uses only webcam would completely eliminate the mouse. Also this would lead to a new era of Human Computer Interaction (HCI) where no physical contact with the device is required

5. ACKNOWLEDGEMENT

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