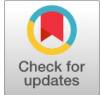# Motion Based Computer Mouse Control

Pulipati Bhargav, Uppalapati Dhanush, Sb Mohammad Ansar

Abstract: This work provides us an efficient way of developing a motion controlled interaction with a computer or laptop without touching it. This is achieved by capturing motion using an external source and processing it to perform the action needed. This work can help a lot of people to save time as they don't need to come over to perform the task and it can also help people who are physically challenged to use the computer as it is all about making hand moments and interacting with the computer [1]. Our work is based on continuous hand picture acknowledgement framework.

Keywords: Remote Control Cursor, Automatred Cursor

I. INTRODUCTION

Nowadays technology has been developing at a fast pace. All things are getting automated and we are interacting with the machines in numerous ways. To work fast and cut off the time needed to do the task we are finding quicker ways to interact with the machines. Our work here falls into this type of research as we wanted to develop a framework system that does not need the human to sit in front of the computer to get the work done as they can just move their hands to get their work done on the PC while doing some other work. This idea is still a new one and we believe that with proper work and research it can be installed in every work station around the world as this is just being installed and practiced in the headquarters of Google and Apple. Here in our work, we tried to control the motion and operation of the cursor on a computer with the help of hand gestures and motion. We aim to use the external camera to capture the motion of the human and detect the action he wants to do on the computer using the cursor. We will train the computer with a lot of pre-tape, which will help the computer to understand what a gesture or motion means. We also used colour analysis to make it easier for the user and the computer to communicate. As we assigned specific meaning to each colour so the computer not only looks for the motion it also analyses the colour of tape on the finger [2] [3]. The existing proposed work uses markers to identify the actions on the flip side we wanted to be more specific and choose the colours to distinguish and categorize the actions.
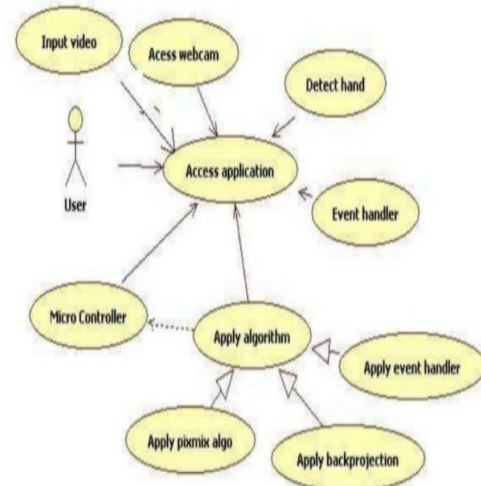
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II. USE CASE DIAGRAM

Figure 1: Use Case Diagram
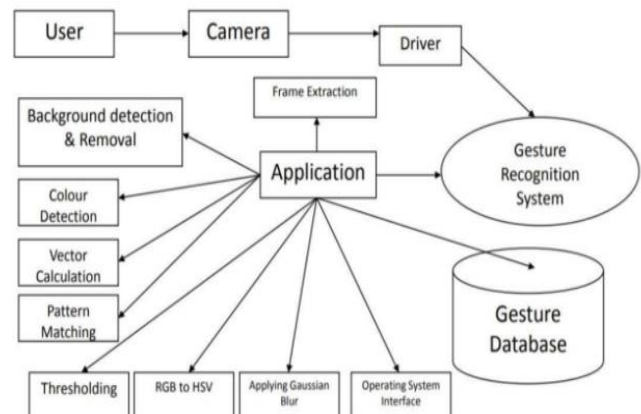
III. FLOW CHART

Figure 2: Flow Chart

IV. OVERVIEW

The hand is handled through the foundation discovery technique. The resultant hand picture is changed over into twofold picture. Then, at that point, fingers are perceived by applying division between fingers and palm [4]. Further, the fingers are handled. Ultimately, hand signals acknowledgment happens through a basic rule classifier
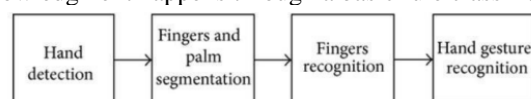

Figure 3: Overview

V. HAND DETECTION:

Figure 4: Hand Detection

VI. METHODOLOGY

1. Capturing the real time video
2. Colour detection
3. Determine the Centroid
4. Performing cursor operations.

A. Capturing video:

The project requires an sensor or device that is capable enough to detect motion and take in the pictures of the motion. Pc camera or and other motion capturing device can be used here to detect the motion of the hand.
1. Webcam is used to capture video.
2. Video is isolated into Picture outlines in light of the FPS (Edges each second) of the camera
3. Handling of individual Casings.

B. Determine the Centroid:

For the user to perform an action using the cursor he needs to understand the motion and directions of the cursor. Like how he has to place the cursor on the application or the file. With the help of directions, it makes it easy for the system to handle the pointer. Matlab has the function to find the canter point of the object or specified region. It generates vertical and horizontal coordinates of the centroid. These values are not constant it depends on what application and area of the screen the cursor is on [5] [6].

C. Colour detection:

Colour separation of the picture detected is done by removing shading smothered channel from dark scale.

D. Performing cursor operations:

INPUT	ACTIONS PERFORMED
One red colour	to control the pointer position
one green colour	for scroll up and down
One blue colour	For left click
Two blue colour	For right click
Three blue colour	For double click

VII. ALGORITHM

- Video Recording.
- Image Processing.
- Flipping images.
- Convert to gray scale.
- Colour extraction of RGB
- Binary image Extraction.
- Centroid determination.
- Locate the cursor.

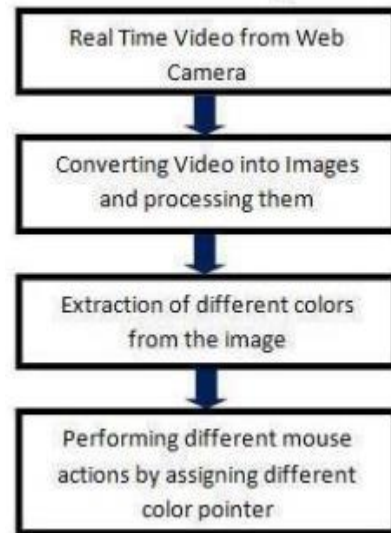- Distinguishing between different mouse actions by different colours.

Figure 5: Algorithm

VIII. RESULTS:

The following shown are the images of the method which we have proposed for cursor control.
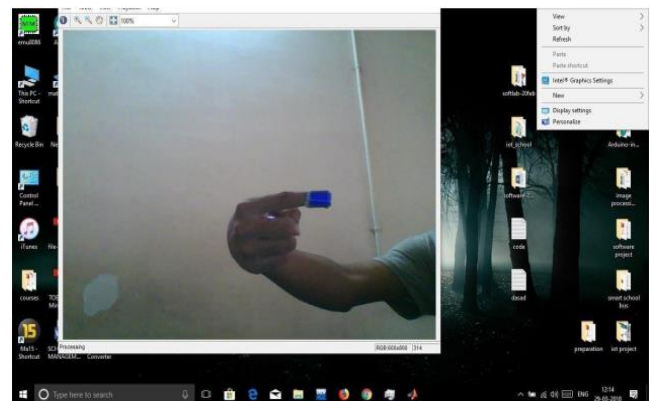

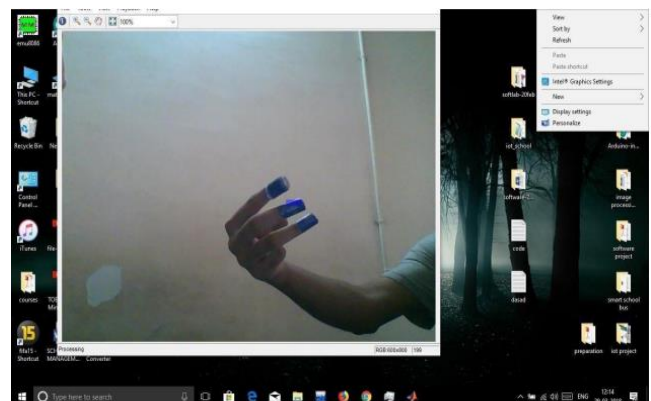**Figure 6: Image 1 of the method which we have proposed for cursor control**

Figure 7: Image 2 of the Method Which We Have Proposed for Cursor Control
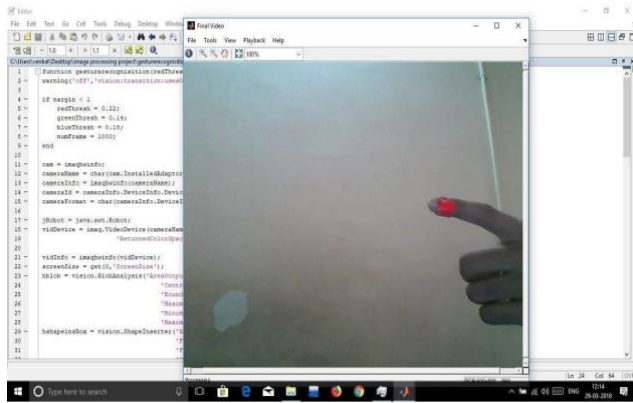
Figure 8: Image 3 of the method which we have proposed for cursor control

The colours which we use for the proposed system are red, green and blue [7].

IX. CONCLUSION

The presented idea that we have worked on provides motion-based mouse operations for the computers with the help of an external motion capturing source. Matlab platform has been used to find the dimensional aspects of the cursor and how to place the cursor on the screen and applications. This work has a lot of potential and will be the future as we want things to happen with less effort. This can help a lot of physically handicapped people to operate the computer with proper research and developed technology. This concept is already a part of the gaming industry where we play motion-based games and pretty soon it will be the future of computers. As the system depends on the motion of the person there is a possibility of partial enlightenment. The presence of other hued objects in the foundation could make the framework give an incorrect reaction.
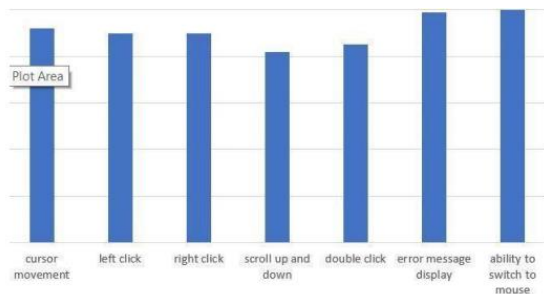

Figure 9: Plot Area

REFERENCE

1. Erdem, A., Yardimci, E., Atalay, Y., & Cetin, V. AE "Computer vision based mouse", Acoustics, Speech, and Signal Processing, 2002. In Proceedings.(ICASS). IEEE InternationalConference
2. Park, H. (2008). A method for controlling mouse movement using a real-time camera. Brown University, Providence, RI, USA, Department of computerscience.
3. Lien, C. F. Portable Vision-Based HCI–A Realtime Hand Mouse System on Handheld Devices. National Taiwan University, Computer Science and Information Engineering Department.
4. Kumar, V., Niyazi, K., Mahe, S., &Vyawahare, S. (2012). Mouse simulation using two coloured tapes. arXiv preprint arXiv:1204.1277.
5. Shah, K. N., Rathod, K. R., &Agravat, S. J. (2014). A survey on human computer interaction mechanism using finger tracking. arXiv preprintarXiv:1402.0693.
6. Gonzalez, R. C., & Woods, R. E. (2012). Digital imageprocessing.
7. Malik, S. (2003). Real-time hand tracking and finger tracking for interaction CSC2503F project report. Department of Computer Science, University of Toronto, Tech.Rep.

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