SYSTEM CONTROLLING USING COLOUR DETECTION AND HAND GESTURE

Hashmat Usmani[1], TarunJain[2], Aakanksha Bhargava[3]

[1]Assistant Professor, [2,3]Fourth year, Department of Electronics and Communication Engineering
RKGIT, Ghaziabad, U.P.

Abstract -We put forward the combinational use of simulating software & hand gestures which dispenses a fascinating substitute of inconvenient interface devices for Human-Computer interaction (HCI). Many hand gesture recognition methods using visual analysis have been invented: syntactical analysis, neural networks, the hidden Markov model (HMM). In the preliminary processing phase, our approach consists of three different strategies for hand localization, hand tracking, and gesture spotting. The hand location procedure detects hand candidate regions on the basis of skin-color and motion, the hand tracking algorithm finds the centroids of the moving hand regions, connects them, and assembles a hand trajectory, and the gesture spotting algorithm divides the trajectory into real and meaningless segments. This method uses a combined and weighted location, angle, and velocity feature codes.

***Key Words*:**Gestures, HCI, Colour detection, Centroids, Mouse

1.INTRODUCTION

Technology continues to advance. Increasingly, we are recognizing the importance of human computing interaction (HCI) and in particular vision-based gesture and object Recognition. In our project, we propose a novel approach that uses a video device to control the mouse system(Mouse tasks). We employ several image processing algorithms to implement this. The approach of initiating a procedure of interaction between humans and computers is evolving since the invention of computer technology. An excellent invention in HCI (Human-Computer Interaction) technology is Mouse. Though other technologies like wireless and Bluetooth mouse have been invented, still, they are not completely device-free. They both have a requirement of battery power and connecting dongle. The proposed mouse system here is beyond these limitations. This paper puts forward a virtual mouse system based on HCI using computer vision, hand gestures, and color-coding. Gestures and color-coding captured with a built-in camera or webcam are processed with color segmentation & detection technique. The person will be allowed to control cursor functions with hands that bear colored caps on fingertips, or a glove can be used for that purpose. They can perform right clicks, left clicks, double clicks, scrolling up/down using just their hand. This system captures frames using a webcam or built-in cam and processes the frames to make them track-able and after that recognizes gestures by the user & performs the mouse function. So, the proposed mouse system eliminates device dependency. Therefore it can be beneficial in the evolution of HCI technology.

2. CONSTRUCTION AND WORKING

1. WEBCAM

It will capture and recognize the user's hand gestures using the in-built camera or a webcam. It'll then send the data to the computer system. Movements of the fingers will be tracked. This system would provide considerably less information about the hand.

2. COLOR STICKERS (R G B)

These stickers will be at the tip of the fingers of the users. Marking the user's fingers with red, green, and blue stickers will help the webcam recognize gestures. The movements and arrangements of these Markers are interpreted into gestures that act as interaction instructions for the projected application interfaces.

3. MATLAB SOFTWARE

MATLAB is a numerical computing environment and fourth-generation programming language. Developed by Math Works, MATLAB allows matrix manipulations, plotting of functions and data, implementation of algorithms, creation of user interfaces, and interfacing with programs written in other languages, including C, C++, Java, and Fortran. Although MATLAB is intended primarily for numerical computing, an optional toolbox uses the Mu-PAD symbolic engine, allowing access to symbolic computing capabilities. An additional package, Simulink, adds graphical multi-domain simulation and model-based design for dynamic and embedded systems.

3. FLOW CHART

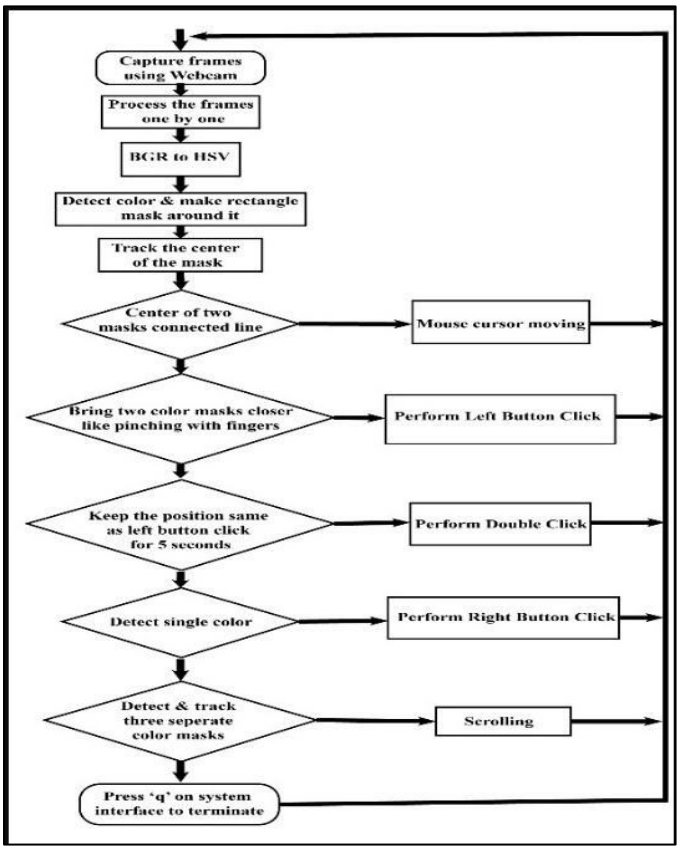

Fig 1: Flow Chart

4. RESULT &CONCLUSION

Architecture for designing a smart system control using hand gestures and Color detection is provided in this paper. The system simply works on the movements/gestures of hands and

the color stickers on the fingers. The software used here is MATLAB, This approach can be very helpful as it does not need an actual mouse to operate the computer system.

REFERENCES

[1] A. Erdem, E. Yardimci, Y. Atalay, V. Cetin, A. E. "Computer vision-based mouse", Acoustics, Speech, and Signal Processing, Proceedings. (ICASS). IEEE International Conference, 2002

[2] Hojoon Park, "A Method for Controlling the Mouse Movement using a Real-Timee Camera", Brown University, Providence, RI, USA, Department of computer science, 2008

[3] Chu-Feng Lien, "Portable Vision-Based HCI – A Realtime Hand Mouse System on Handheld Devices", National Taiwan University, Computer Science and Information Engineering Department

[4] Kamran Niyazi, Vikram Kumar, Swapnil Mahe, Swapnil Vyawahare, "Mouse Simulation Using Two Coloured Tapes", Department of Computer Science, University of Pune, India, International Journal of Information Sciences and Techniques (IJIST) Vol.2, No.2, March 2012

[5] K N. Shah, K R. Rathod and S. J. Agravat, "A survey on Human Computer Interaction Mechanism Using Finger Tracking" International Journal of Computer Trends and Technology, 7(3), 2014, 174-177

[6] Rafael C. Gonzalez and Richard E. Woods, Digital Image Processing, 2nd edition, Prentice Hall, Upper Saddle River, New Jersey, 07458

[7] Shahzad Malik, "Real-time Hand Tracking and Finger Tracking for Interaction", CSC2503F Thesis Report, December 18, 2003

[8] The MATLAB website. [Online]. Available:

http://www.mathworks.com/matlabcentral/fileexchange/2
8757-tracking-red-color-