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Virtual Mouse

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ABSTRACT

The field of human-computer interaction has seen tremendous advancement in recent years. In this project, we used a Human Computer Interaction strategy in which we aimed to include the use of a hardware mouse and control the mouse points with hand gestures and colour recognition. With the use of a camera and a colour recognition technology, hand motions were captured. We have attempted to remove the boundaries of contact between humans and computers by replacing current hardware with gestures, motivated by the thought that we can communicate with the computer system.

The goal is to move the mouse pointer on the screen without using any hardware, such as a mouse, and instead by utilising finger motions, i.e. the gesture recognition process. Different technologies have been explored in the development of virtual mice in recent years. Our project's suggested technology focuses on three main areas: object identification, picture processing, and colour recognition. We demonstrate an innovative method to Human Computer Interaction in this research, in which cursor movement is controlled by a real-time camera.

KEYWORDS

Virtual mouse control, Hand gesture recognition, Finger Detection , Finger counting ,Colour Segementation

INTRODUCTION

The goal of this project is to move the mouse pointer on the screen without using any hardware, such as a mouse, and instead by utilising finger motions, a technique known as gesture recognition. Different technologies have been explored in the development of virtual mice in recent years. Our project's suggested technology focuses on three main areas: object identification, picture processing, and colour recognition. We will demonstrate a unique way to Human Computer Interaction in which cursor movement is controlled by a real-time camera in this project.

During the processing of the object and colour recognition, this project will also make use of camera technology. Background subtraction will be used to identify colours, and the convex hull approach will be used to distinguish motions. Both of these approaches will be implemented using OpenCV, a prominent Python package that is widely used for image processing.

LITERATURE SURVEY

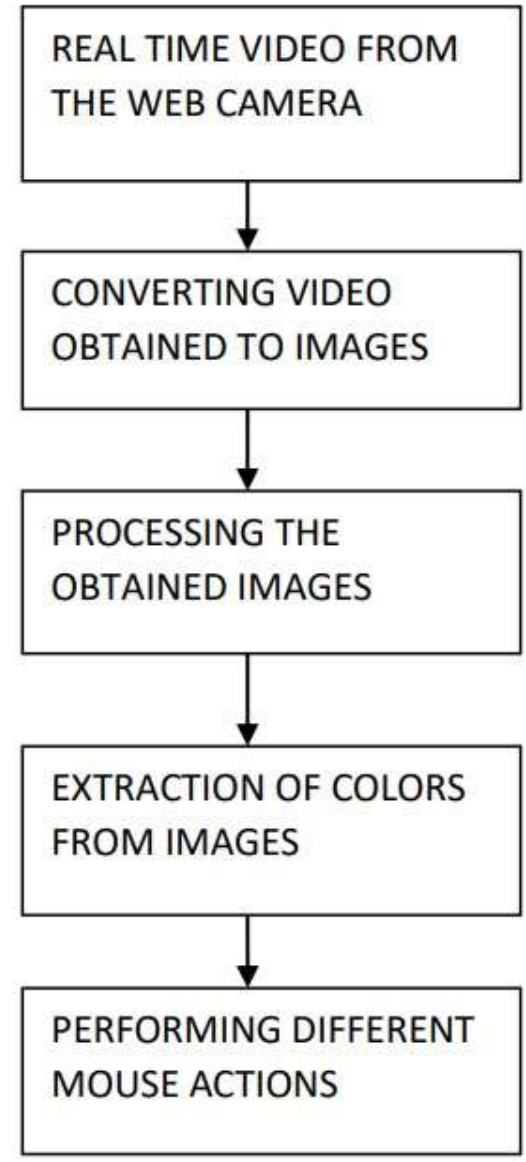
S No	Title of the Paper	Authors	Publisher	Paper Gist
1	Real-time virtual mouse system using RGB-D images and fingertip detection	Dinh-SonTran, HyungJeong Yang, Ngoc-Huynh Ho Soo-HyungKim & Guee Sang Lee	Springer 2020	->Hand identification and segmentation witha Microsoft Kinect Sensor version 2 depth picture ->K-cosine Corner Detection for finger tip ->bordertracing algorithm ->tracking, locking the target individual -> The accuracy of the screen degrades as the number of persons increases.

2	Robust segmentation of the image by fusing the SDDclustering result from separate colour space	Zhenzhou Wang	The Institute of Engineering and Technology Image Process., 2020,	-> SDD clustering is a novel colour segmentation approach that is more successful than conventional clustering algorithms.
3	Video Based Hand Gesture Detection System Using Machine Learning	Manjunath R Kounte, E Niveditha, A Sai Sudeshna, Kalaigar Afrose	International Journal of Advance Science and Technology 2020	-> CNN and Machine Learning -> For faster calculations of neural networks, they employed the nvidia jetson nano kit. -> A project focused on speed and efficiency. -> A hardware-efficient dynamic gesture detection system.
4	Gesture Recognition Based Virtual Mouse and Keyboard	Sugnik Roy Chowdhury, Sumit Pathak, M.D. Anto Praveena	Proceedings of the Fourth International Conference on Trends in Electronics and Informatics (ICOEI 2020)	-> The convex hull approach is used to determine the type of hand-gesture displayed. -> Convex Hull defects are first created, and then an algorithm is created based on the defect calculations. -> The mouse and keyboard functions are then mapped to the defects.
5	Medical image processing using python and open cv	CE Widodo, K Adi, R Gernowo	Journal of Physics Conference Series(2020)	We learned about the Python programming language and the Open Source project CV library in this paper.

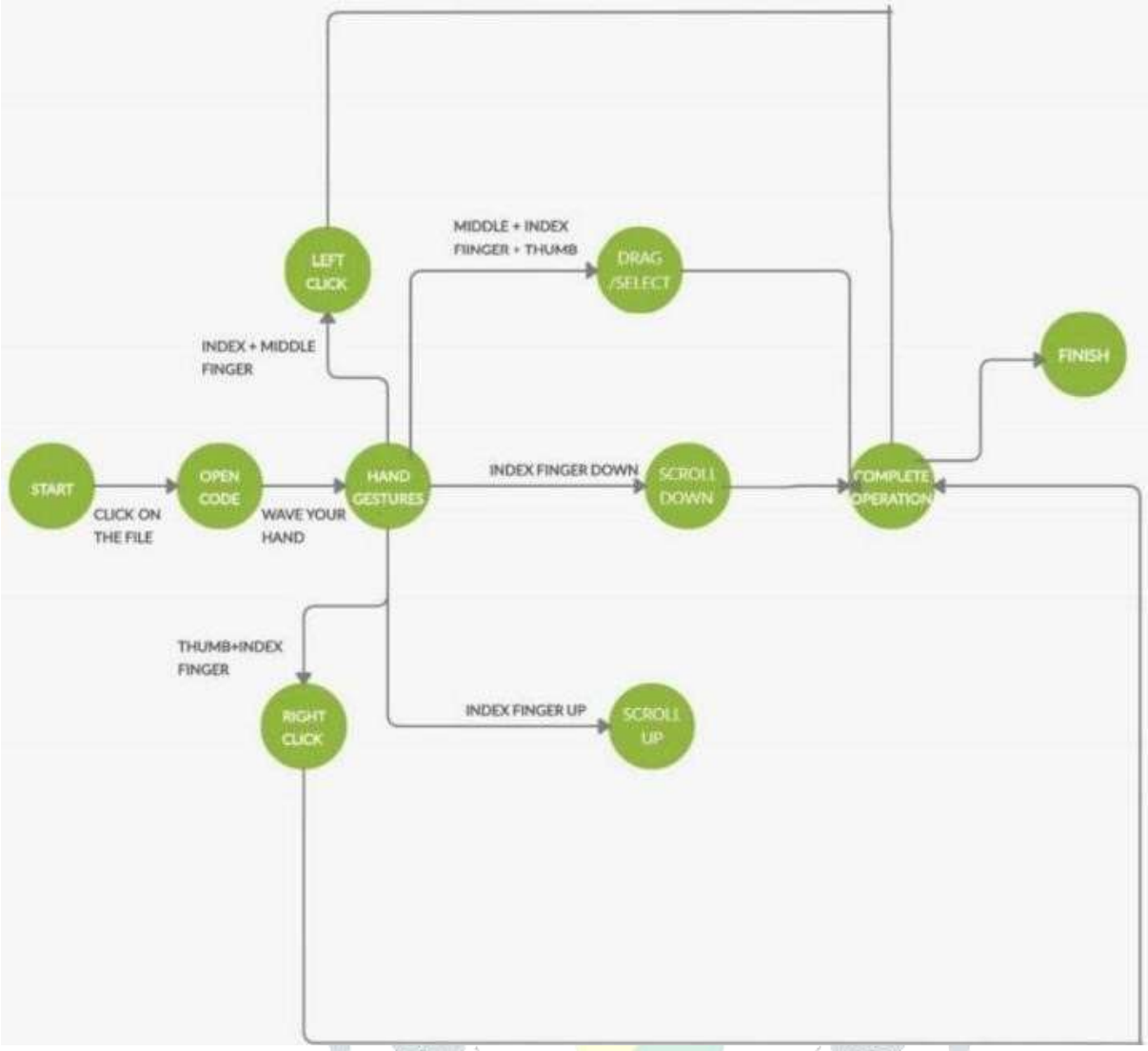
6	algorithm based on convex hull analysis	AP Nemirko, JH Dulá	14th International Symposium "Intelligent Systems"	We learnt how to use convex hull algorithm.
7	Comparison of human detection using background subtraction and frame difference	MS Zaharin, N Ibrahim, TMAT	Bulletin of Electrical Engineering and Informatics(2020)	We understood the working of background subtraction.
8	Python with Spyder: An Experiential Learning Perspective	Poornima Naik, Kavita Oza	Shashwat Publication	We understood the right usage of spyder

METHODOLOGY

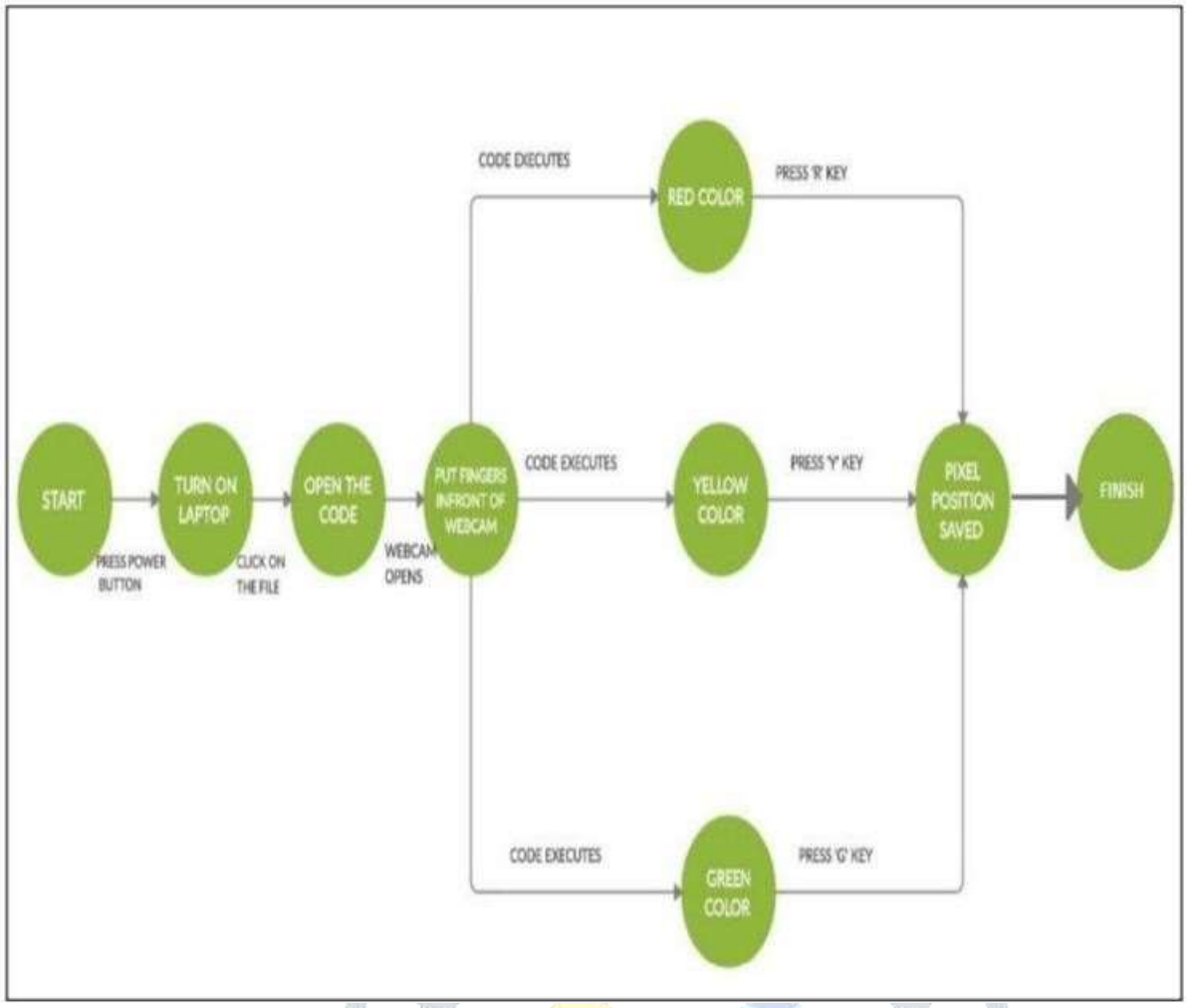
Basic Block Diagram Of The System:



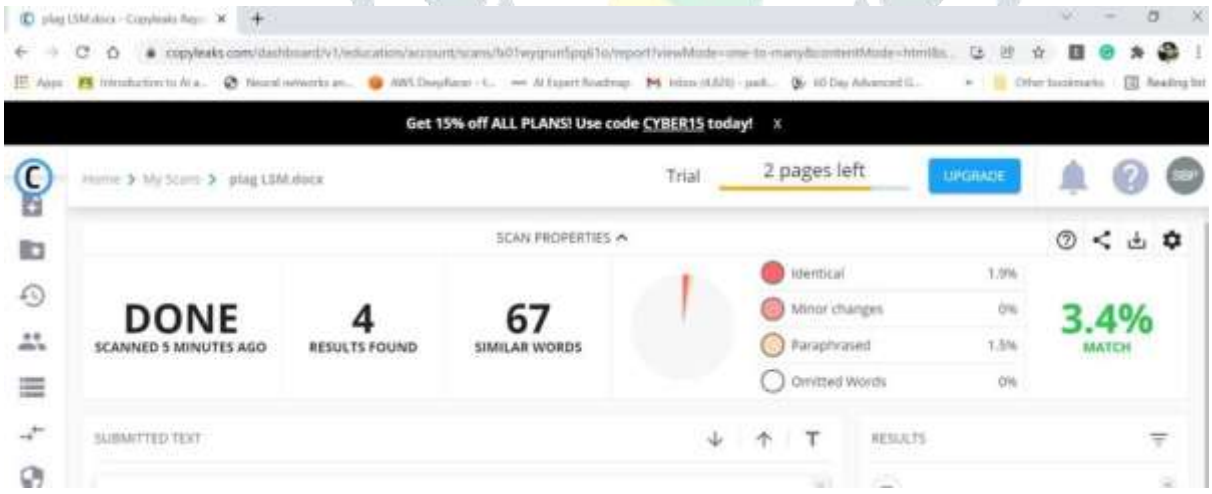
Gesture Control



Colour Detection



Palagrism



FREE MOVEMENT

LEFT CLICK

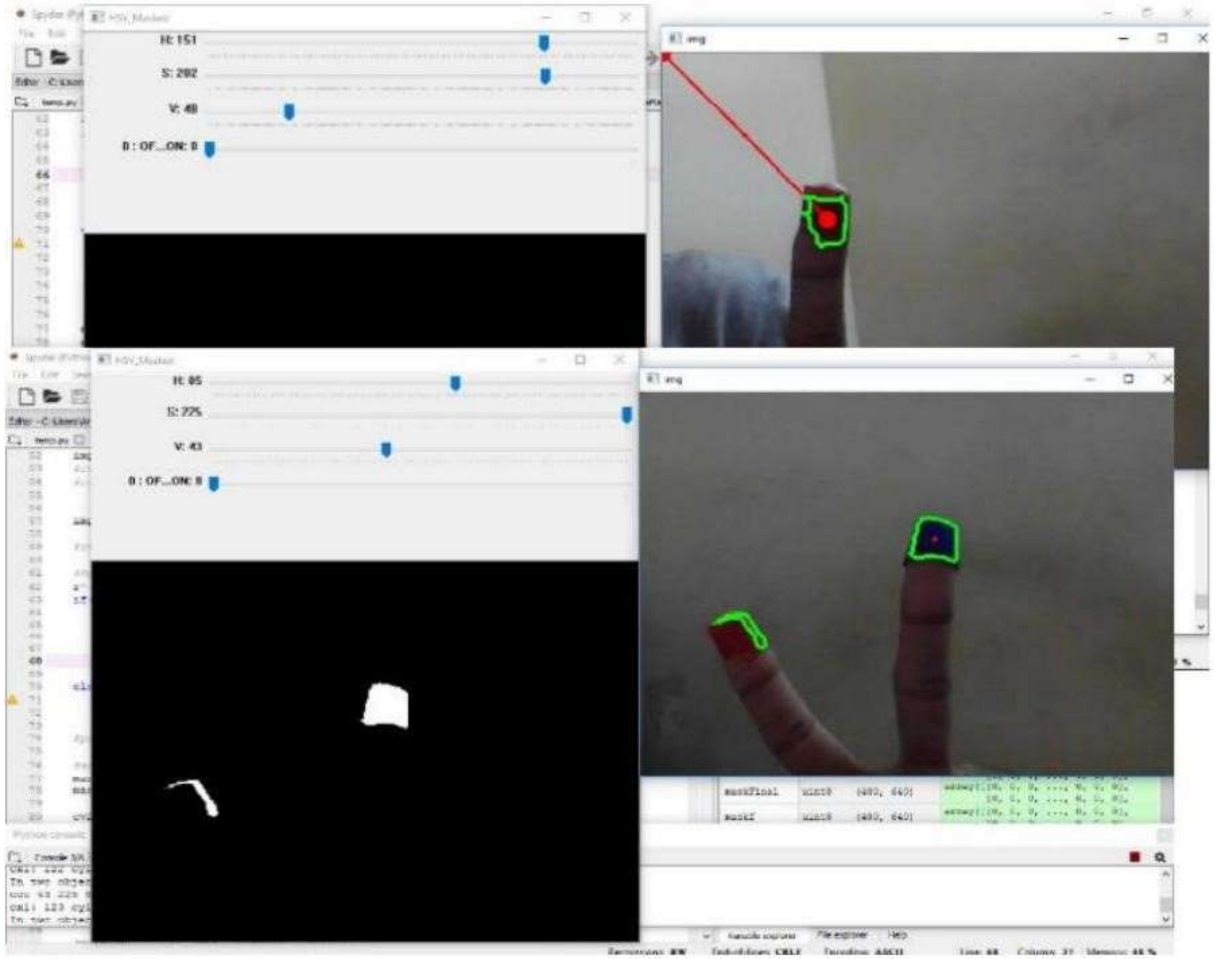
RIGHT CLICK

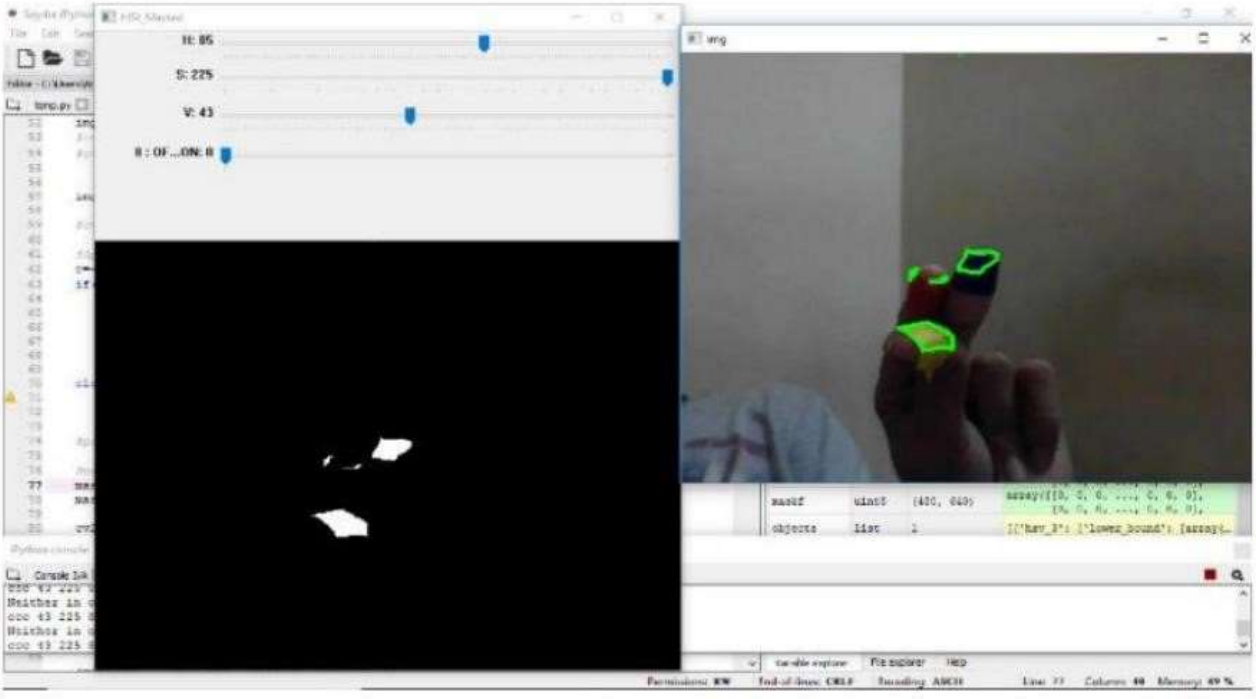
SCROLL UP

DRAG / SELECT

SCROLL DOWN

RESULTS





CONCLUSION

Running a hospital is a very tedious task where management is a key concern . There is a need to manage the staff , keep records of bills , manage and keep the inventory updated . Almost every hospital uses a management system today. The proposed inventory management system offers a very simple and easy to use UI which reduces manual work load. Although there are systems present in the market for the same cause, this is totally free of cost and can be altered as per the needs of different users. So this was our humble attempt aimed to develop an inventory management system for hospitals to make their everyday tasks more simple and efficient.

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