GESTURE CONTROLLED BED MOVEMENT

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Abstract - Automation plays a vital role in our daily life. Hand gesture recognition is the main implementation in an automation field. This project states that a problem of adjusting the position of the bed with the help of hand gesture. We need inter mutual application for hand gesture recognition for implementing this work in a real-time system. For this real-time system, webcams are used to enable the hand gesture for human-computer interaction. It is proposed to demonstrate a real-time system to change the position of bed by hand gesture signs using webcams and simple hardware components.

1. INTRODUCTION

In recent years, society is facing many sociological and financial challenges, so there is less time for the elderly and paralyzed person. The number of disabled people in society is growing in which the patient is unable to take care of themselves. Continuous monitoring of these patients may require a fulltime caregiver, which is not always possible due to social or financial constraints. There are only two bed motions (up and down) of the existing electronic bed systems in hospitals. So, to minimize caretakers' requirements and increase the comfort level of the patients here, we have proposed a gesture control bed movement in which we have designed the motion of the bed based on the different hand gestures to the existing electronic bed systems.

2. LITERATURE SURVEY

A previous version of our system was presented in [1]. One limitation of that method was that uses openCV Java. So that system faces the program complexity. The framework for human activity recognition using 3-D gesture posture data has been stored by using the Microsoft Kinect. Kinect is responsible for gathering high-level information about what the user is doing[6]. Several types of optical motion capture systems are capable of tracking the 3-D position and configuration of the hand. Users can interact with PC applications or games by performing hand gestures instead of relying on physical controllers [2]. There are other obvious advantages of thermal imagery, such as the ability to operate in complete darkness, which make it ideal for convert surveillance and proposed work of face recognition is done with the help of paper [3]. RGB color representation introduces color distortions and loss of information. An improvement on skin color modeling would be to depart from the traditional tri-stimulus paradigm. Using human skin spectrograph data, they demonstrated that spectrophotometric information reveals skin color details that help explain the uniqueness of skin color and its variations [4].

In this paper, author [5] experimented the gesture recognition that based on the local brightness of each block of the gesture image, the input gesture image is divided into 25x25 blocks each of 5x5 block size, and we have calculated the local brightness of each divided block after applying colored segmentation operation using HSV (Hue, Saturation and Value) color model, so, each gesture produces 25x25 feature values called feature vector, it shows that more that 65 % of these features were zero value which leads to minimum storage space, the recognition rate achieved was 91 % using 36 training gestures and 24 different testing gestures. Ubiquitous Computing is used to interact with the electronic devices using their habitual body gestures as they communicate with each other. It can be achieved by wearable gestural device named Magic Ring (MR) [7]. The Skin has been detected by using two methods. The two methods namely known as color-histogram based approach, Lookup table based approach. Adding double thresholding, Bayesian method, Bayesian method with texture detection has been invoked from the paper [8].Gesture control can enable them to do work without any obstruction. They can be able to use their different parts of body for the control operation. By their bodies they can control anything they cannot control normally like physically fit people. There has been a shift in technology from using touch screen, touchpad and keyboards to simply using hand gestures for controlling devices and gadgets. Its roots can be clearly seen in the video gaming world where people use hands to control the car, bike or gun operation [10].

The conventional technology of human computer interaction is mouse and keyboard. This technology has been replaced with eye blink and head movements. The system track the computer users head movements with a video camera and translates them into the movements of the mouse pointer on the screen and it also detect the user eye blink and translates them into mouse click events on computer screen. Movement of mouse cursor was implemented by head movement and mouse clicking events was implemented by eyes blink. The movements of mouse cursor were implemented using Viola-Jones algorithm and

mouse clicking events were implemented using Template Matching algorithm [11]. Skin detection has been made by Self-Organising Map or SOM. It uses AXEON Learning Processor as the basis for a hardware skin detector. Using the SOM to construct skin tone detectors comparable to those built with convention histogram and mixture model techniques [12]. Depth sensor and Public datasets were widely used to detect the 3D hand gesture recognition. 3D hand gesture recognition in four aspects: 3D hand modelling, Static hand gesture, hand trajectory gesture recognition and continuous hand gesture recognition [13].

3. PROPOSEDWORK

The plans and techniques used in the design and development of the Hand gesture recognition for change the position of automatic adjustable beds in hospitals are described in this section.
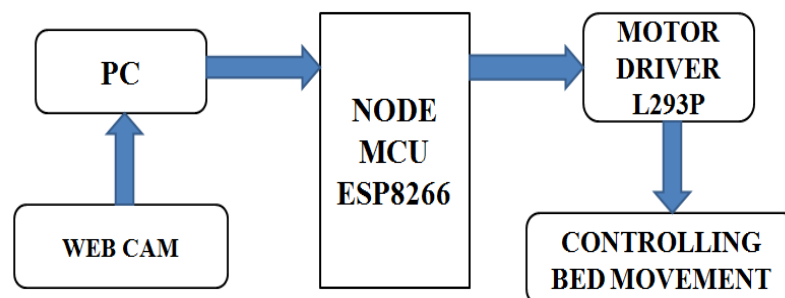

Fig -1: Block Diagram of Proposed Work

In order to perform hand gesture recognition to control bed position, many tools, libraries and languages are used like Open Source Computer Vision Library. Open CV established in Python Language. Python 3.7.4 version is an open source environment for compile the source code. It has many inbuilt function for recognizing hand gesture. The main component used here is the ESP8266 Node MCU. It is one kind of Wi-Fi module. It is used to get the information from the cloud, based on the command it can take the necessary action and then change the bed movement.
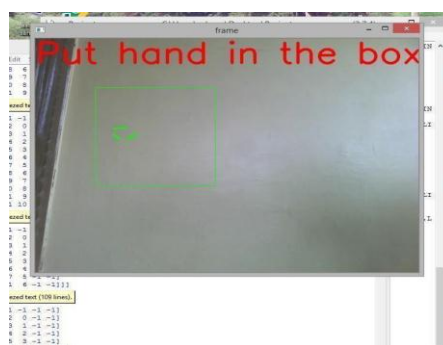
4. RESULTS AND DISCUSSION

Fig - 2: The dialogue box opens for fixing the hand gesture
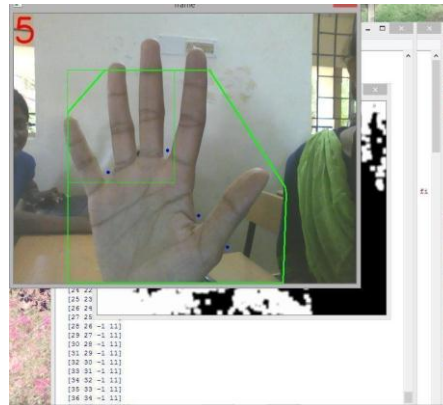
Fig - 3: Simulated output

Fig - 4: Working model of the proposed work.

The main purpose of the proposed design is to use gesture to control the movement of our beds. Initially we got a web cam motion action. We can get output from the python shell from the gesture movement. Our bed movement can be adjusted based on the python performance.

5. CONCLUSION

The proposed Gesture Controlled Bed movement is simple to use, and it is an inexpensive one. It is possible to provide a man-machine interaction system, which can be able to manage the movements of the bed position through the recognition of hand gestures. The three-coin algorithm applied to examine convex envelop and dirty points. The estimation of the palm center position is done through the Skyum algorithm, while the Gram algorithm is used to find fingertips. A machine algorithm is used to set the position through different hand gestures.

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