



Power Point Presentation Control Using Hand Gestures Recognition

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ABSTRACT—

The created system enables efficient and simple human-computer interaction using the real-time static hand gesture recognition. This method generates control of a Power Point presentation may be possible by distance. The user does not have to manage the Power. Use a laser Pointer, mouse, or keyboard to make presentations. The suggested system uses data from a small webcam with four hand-held gestures. Following that, the image obtained from the input data is processed, followed by the histogram of features with directed gradients distilled from it. The transformed image is then compared to the gesture image database. Image comparison and identification making use of the CNN (Convolutional Neural Network) method. Real-time static hand gesture recognition is used in the development of the suggested system to enable efficient and painless human-computer interaction. Through the use of this technique, Power Point presentations can be remotely controlled.

Index Terms—Hand Gesture Recognition, Human-Computer Interaction, PowerPoint Presentation, HAAR Cascade Algorithm.

INTRODUCTION

In recent years hand gesture recognition system is one of the most trending topic for research. Gesture recognition is essential for human-computer interaction in the modern world. Communication between humans and computers is facilitated through gesture recognition. With the suggested method, users can control a slide show without ever touching a computer by using just four simple gestures. The background elements and fluctuating ambient lighting combine to create the final visual gesture. The captured image is then subjected to segmentation. Additional processing is used to make the segmented image appropriate for comparison with the gesture images stored in the database. In modern world, gesture recognition is essential for human-computer interaction. Gesture recognition makes it easier for people to communicate with computers and allows them to do so without the use of mechanical devices like keyboards, laser pens or any other number of items. Users of the proposed system can operate the SLIDESHOW presentation with just four easy gestures without ever touching the PC.

Gesturing can help people for clearer thoughts, speak in tighter sentences and use more declarative language. Hand gestures can increase your impact when you are having an important conversation, making a speech or giving a presentation.

RELATED WORK

In this paper [1], Explains the solar grass cutter using hand gesture, solar powered robotic grass cutting machine that eliminates the obstacles and could be accessed from every direction by utilizing hand gesture through remote camera which is introduced to the highest point of the motor-vehicle to communicate remote gushing to the users end. The system uses a 6v batteries to drive both the motor vehicle movement and the grass cutter engine. The system also uses solar panels to charge the battery, so that no additional battery is required. The grass cutter and vehicle motors are interfaced with a microcontroller's family which controls all the motors running. It is also interfaced with ultrasonic sensor to track the object. There are essentially three parts of the framework; the transmitter; the receiver and the live gushing area.

.In this paper [2], Introduced a comparative study of using deep neural networks in non-contact hand gesture recognition based on millimeter wave FMCW radar. Range-doppler maps are processed with a zero-filling strategy to boost the range and velocity information of gesture motions. Two optimal types of deep neural networks, 3D-CNN and CNN-LSTM are respectively constructed to reveal the temporal gesture motion signatures encoded in multiple adjacent radar chirps. With the proposed networks, the recognition accuracy of six popular hand gestures reach to 95 data size on the recognition accuracy. The proposed methods can be applied in the recognition of minor finger motions, providing some preliminary experimental results compared with other baseline methods.

In this paper [3], The use of hand gestures provides a natural alternative to cumbersome Interface devices for Human-Computer Interaction (HCI) Systems.

- The gestures should be performed naturally without distracting the driver,
- Micro hand gestures occur within very short time intervals at spatially constrained areas,
- The performed gesture should be recognized only once, and
- The entire architecture should be designed lightweight as it will be deployed to an embedded System.

In this paper [4], In human-computer interaction, virtual mouse implemented with finger tip recognition and hand gesture tracking based on image in a live video is one of the studies. In this paper, virtual mouse control using finger tip identification and hand gesture recognition is proposed. This study

consists of two methods for tracking the fingers, one is by using colored caps and other is by hand gesture detection. This includes three main steps that are finger detection using color identification, hand gesture tracking and implementation on on-screen cursor. In this study, hand gesture tracking is generated through the detection of the contour and formation of a convex hull around it. Features of hands are extracted with the area ratio of contour and hull formed. Detailed tests are performed to check this algorithm in real world scenarios. In this paper [5], The proposed system is developed using static hand gesture recognition in real-time that facilitates effective and effortless human-computer interaction. This system makes possible the control of Power Point presentation through distance. It is not necessary for the user to control the Power Point presentation through keyboard or mouse or laser pointer. This system does not make use of traditional methods for hand gesture recognition such as by using hand-gloves, markers, rings, pens or any other devices. The proposed system takes the input data from the portable webcam consisting of four hand gestures. The image captured from the input data is then processed and then histogram of oriented gradients features is extracted from it. The processed image is then compared with the database of gesture images. Image is compared and recognized using K-nearest neighbor algorithm. The recognized image is then used to control the Slide-Show Presentation. The system is tested in different kinds of light sources – dull, medium, and bright. Gesture images are properly detected when the background consists of bright light. when debilitated individual need assistance.

SYSTEM ARCHITECTURE

Gesture recognition is essential for human-computer interaction in the modern world. Communication between humans and computers is facilitated through gesture recognition. Gesture recognition makes it easier for people to communicate

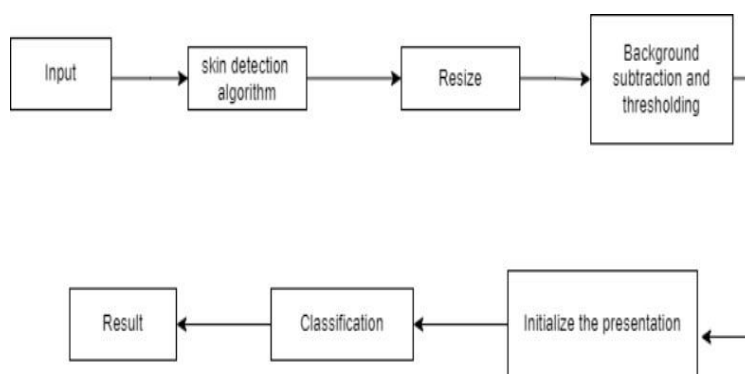


Fig. 1. System Architecture

with computers and allows them to do so without the use of mechanical devices like keyboards, laser pens, or any other number of items. With the suggested method, users can control a slide show without ever touching a computer by using just four simple gestures. The background elements and fluctuating ambient lighting combine to create the final visual gesture. The captured image is then subjected to segmentation. Additional processing is used to make the segmented image appropriate for comparison with the gesture images stored in the database. One technique for detecting hand gestures involves counting the fingers after finding the centroid of the object region using the Distance transform method. Users of the proposed system can operate the SLIDESHOW Presentation with just four easy gestures without ever touching the PC. Proper background lighting conditions are anticipated when recording the input gesture. Both an extremely bright and a very dull background should be avoided. Typically, daylight is the best time to take gesture photographs. The palm of the hand is the sole part of this motion that is used. Some people also use circular profiling to count the number of fingers. A directional search technique is used by some systems to identify the full hand contour. Some systems employ the camshaft approach to track hands and their gestures, To extract gesture information and recognize gestures.

ALGORITHM

A. Hand Detection Gesture Recognition – OpenCV Python

Hand gesture recognition is one of the most viable and popular solution for improving human computer interaction. In the recent years it has become very popular due to its use in gaming devices like Xbox, PS4, and other devices like laptops, smart phones, etc. Hand Detection gesture recognition has usage in various applications like medicine, accessibility support etc. In this paper, we would like to propose on how to develop a hand gesture recognition simulation using OpenCV and python 3 Histogram based approach is used to separate out the hand from the background image. Background cancellation techniques are used to produce optimum results. The detector hand is then processed and modelled by finding contours and convex hull to recognize finger and palm positions and dimensions. Finally a gesture object is created from the input which is then used to recognize the count of fingers. CVZONE This is a Computer vision package that makes it easy to run Image processing and AI functions. At the core it uses OpenCV and Mediapipe libraries. You can simply use pip to install the latest version of cvzone. Gesture recognition (Hand Detection) is an active research field in Human-Computer Interaction technology. It has many applications in virtual environment control and sign language translation, robot control, or music creation. In this machine learning project on Hand Detection, we are going to make a real-time Hand detector using the CVZONE module and OpenCV Python.

RESULTS

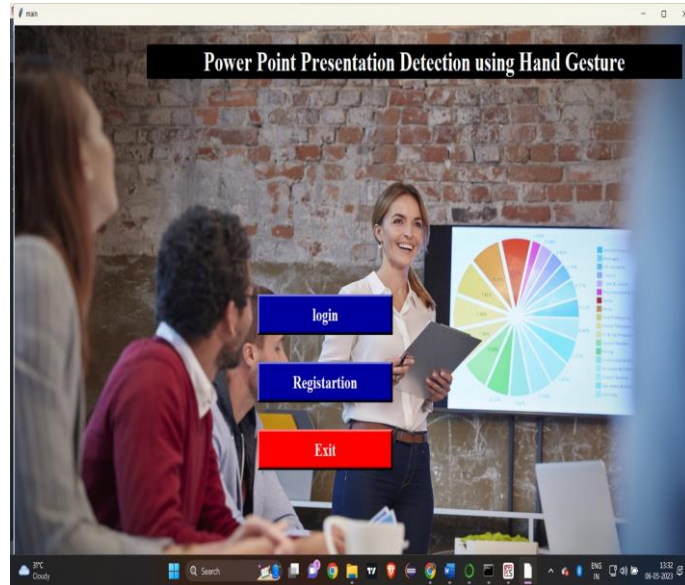


Fig. 2. Main Page

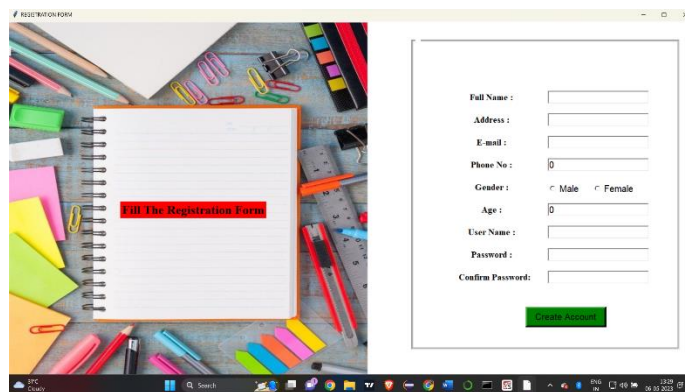


Fig.3. Registration Page

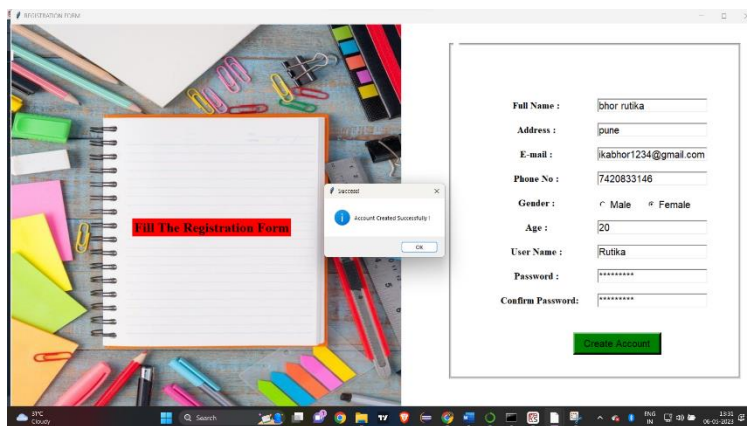


Fig.4. Registration Successful

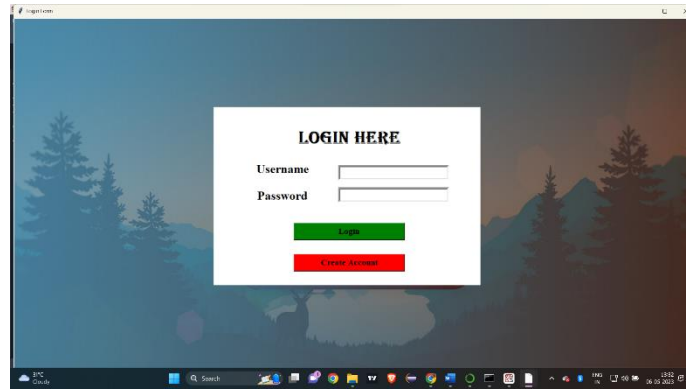


Fig.5. Login Page

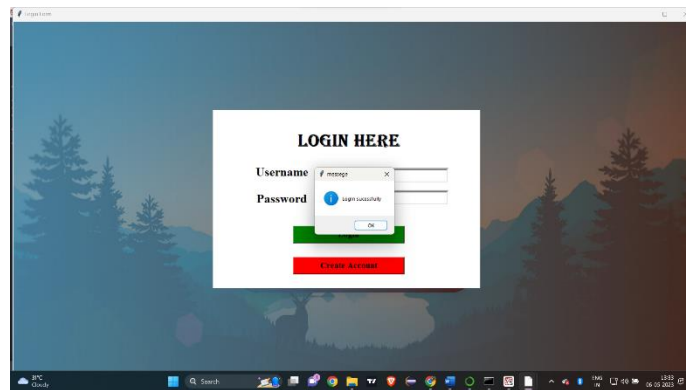


Fig.6. Login Successful

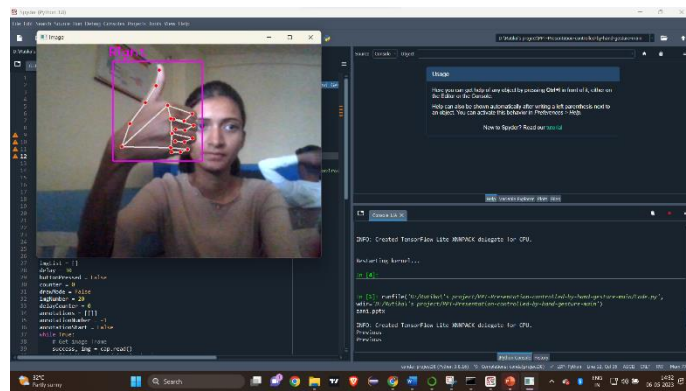


Fig.7. Finger detection

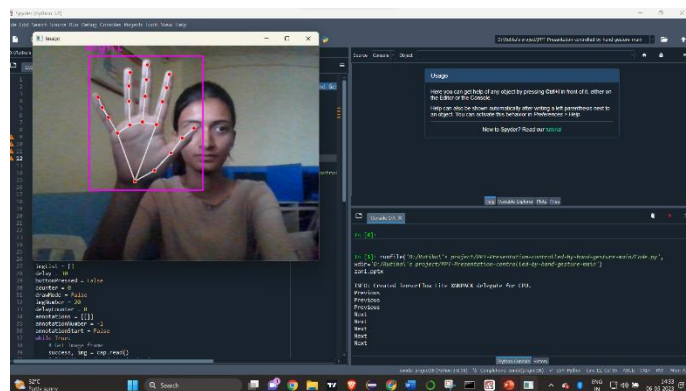


Fig.8. Gestures Detections

CONCLUSION

The proposed system presented in this paper, enables the hu-mans to control the PowerPoint presentation through distance without using any hardware device in between. The system has extracted the Histogram- of-Gradient features of the input gesture images and classified it as one of the four gestures using K-NN classification algorithm. The classification has been done with the help of database of all the four gesture. The accuracy of the proposed system is approximately 80 percent. In future, without using any intermediate device, large number of real time applications such as media player, radio, etc can be controlled just by using hand gestures.

FUTURE SCOPE

In future, without using any intermediate device, large number of real time applications such as media player, radio, etc can be controlled just by using hand gestures.

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