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TOUCH FREE ATM

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ABSTRACT

Due to the COVID 19 pandemic, there is a massive shift in people's behaviour towards digital habits and avoiding physical contacts to reduce the spread of corona-virus. The ATMs we are using nowadays are touch based . So to avoid those problems we are implementing a touch less ATM, where we can get the cash from the ATM without a physical touch. As we touch the ATM buttons, they may carry the coronavirus variants. The system can detect the moving objects without touching the screen. With the help of science and technology advanced equipment, the hand gesture recognition has created an emerging way and acted effectively for decreasing the spread of covid-19 virus. By using this, we can reduce touching the screen, and the personal information can be safe and secure.

INTRODUCTION

With the increase in the advancements of technology, today hand gesture recognition technology has emerged as an effective tool for reducing the spread of infectious disease, one of such technology is use of touch less devices. In the transactions of the Automated Teller Machines (ATM), users interact with the machines primarily through "Touch" interactions and the machine is used by many of users , which increases the risk of infection of covid-19 due to lack of self sterilisation. The emerging trend in the Human – Machine Interfaces is towards the "Touchless" controls and interactions. Gestures are the movements of the body parts to deliver a message.

The human-computer interactions can be allowed by Gesture based interfaces to be in a natural and intuitive manner. The most important advantage of the usage of hand gesture based input modes is that using this method the user can interact with the application from a distance without any physical interaction with the keyboard or mouse. Creating a virtual human computer interaction device such

as a mouse or keyboard using a webcam and computer vision techniques can be an alternative way for the touch screen. The AI virtual mouse system is useful for many applications; it can be used to reduce the space for using the physical mouse, and it can be used in situations where we cannot use the physical mouse. The system improves the human-computer interactions and it also eliminates the usage of devices.

1.1 SIGNIFICANCE OF PROJECT

With the developing technologies within the twenty-one century, the areas of virtual reality devices that we are using in our daily lifestyle. In this system, an AI virtual mouse system takes input of hand gestures and detection for fingertip movement to perform mouse operation in a computer by using Autopsy, Open CV. The most important objective of the proposed system is to perform all the ATM touch based into touch less operations.

Hand gesture and fingertip detection by using computer vision is employed as an individual's and computer interaction, simply referred to as HCI. In this by using

a web camera we will be tracking the hand gestures and performing mouse cursor operations.

1.2 SUMMARY

This project presents a AI virtual mouse method using OpenCV, autopsy and mediapipe by the help of fingertip movement that interacts with the computer in front camera . The AI virtual mouse system is beneficial for several applications like, it is utilised in situations where we cannot use physical operations and it improves Human Computer Interactions. The user can operate all the operations without touching the screen itself.

2. LITERATURE SURVEY

[1] Cash Withdrawal from ATM machine using Mobile Banking - 2016 International Conference on Computational Techniques in Information and Communication Technologies (ICCTICT)

The main objective of this paper is to reduce the time of withdrawal of money from ATMs. Here there is no change in the existing system but all operations that are performed on the ATM machine can be performed in the mobile application of the respective user. To get cash from the ATM machine using this feature, a card is required as usual. If there is any pending transaction done by mobile that will be completed first else a new transaction can be started. If there is no smart mobile present with the user then this type of operation cannot be performed.

[2] Security System ATM Machine with One-Time Passcode on M-Banking Application 2019 International Conference on Mechatronics, Robotics and Systems Engineering (MoRSE) 4-6 December 2019, Bali, Indonesia

The main objective of this paper is to introduce a two-factor authentication system which uses the ATM card and the dynamic pin. Here a Raspberry Pi3B is

used. The transaction process starts from the insertion of the card and the next stage is the authentication stage based on the dynamic pin. If the user completes this both stages then the user can proceed with the further transaction. The otp pin is generated with CSPRNG-SHA1-MWC algorithm. The otp pin which has been generated will be stored on the database server according to the account number of the user, the otp pin received by the customer can be used for the next transaction process.

[3] FINGERPRINT BASED ATM SYSTEM
Lini R Assistant Professor, Department of Computer Science, PMSA PTM Arts & Science College, Kadakkal, Kollam, Kerala.

The main objective of this project is to introduce a finger scan in which when a user scans their finger, which if is valid then the user can perform transactions, then after the completion of the transaction then the transaction activity door will be closed immediately.

The disadvantages with the finger print based system includes:

- False Positives: Stolen biometrics can be used to create false positives. False-positive in the biometric means the system incorrectly accepts the user as a match. False positives occur due to stolen data used for authentication or due to very similar faces.
- Expensive: A safe and reliable system can become expensive. The manufacturer has to keep the possibilities of safety to users, reliability and durability of biometrics.
- Malfunction: The biometric system can fail due to bugs in the system. The power shortage may lead to failing biometric systems.

[4] Contactless ATM - Touch Free Banking Experience 2nd International Conference on "Advancement in Electronics &

Communication Engineering (AECE 2022)
July 14-15, 2022.

In this project the main aim is to develop the contact less atm for which first to recognize the hand gesture the video is captured frame by frame. A two step approach is used for the segmentation of the hand region. In this, R-CNN is used for the hand detection and the items which are not the part of the hand are eliminated by calculating the distance from the adjacent pixels and the pixel with the highest intensity is used as the centre of gravity. In these items are selected by simple poke to select like tapping the screen. The user's hand functions like a virtual cursor and provides a touch-less interface.

The disadvantage of Virtual Air Canvas is the issue of the frame rate, image processing slows down the camera feed and produces a cumbersome lag that impedes on the usability of the program.

[5] A Real Time Hand Gesture Recognition System Using Motion History Image
Chen-Chiung Hsieh and Dung-Hua Liou, Dept. of Computer Science and Engineering, Tatung University, Taipei, Taiwan

The main objective of this project is to introduce hand gesture recognition based on the adaptive skin colour model and the hand motion history image. By adaptive skin color model, the effects from lighting, environment, and camera can be greatly reduced, and the robustness of hand gesture recognition could be greatly improved. Here the digital zoom operation is performed automatically based on the user position from the camera.

Static hand gestures are detected based on adaptive skin colour models. Here two types are detected: Fist Hand and Wave Hand. The ROI for fist hand detection is further divided into four small areas. The ROI is firstly transformed from RGB to grey level and then the histogram is equalised for recognition. Waving hand

gesture recognition is based on motion detection and time sequence. Firstly, the motion obtained by subtracting two continuous frames would be very obvious. Secondly, the motion would last for a period of time. Therefore, these two conditions are used to verify waving hand gestures. Dynamic hand gesture recognition was conducted by adopting motion information. Variations among frames could be accumulated in the motion history image.

[6] A Robust Hand Recognition In Varying Illumination Yoo-Joo Choi¹, Je-Sung Lee² and We-Duke Cho³
¹ Seoul University of Venture and Information, ² Korea German Institute of Technology, ³ Ajou University South Korea.

The proposed method acquires the background images for a restricted duration and calculates the mean and standard deviation for the hue and hue-gradient of each pixel within the captured background images. That is, a background model for each pixel is built. The hue and hue- gradient of the input images captured in real-time are calculated and compared to those of the background images. The foreground objects are extracted based on the difference magnitude between those of the input image and the background image. To accurately extract the tight object region of interest, we calculate the eigenvalue and eigenvector for the initially extracted object region and extract the object-oriented bounding box(OBB) on the optimised hand region based on the two eigenvectors. Then, the OBB region is divided into 16 sub-regions and the hand region profile is produced based on the histogram created from the number of edges for each sub-region. The profiles of nine hand poses are trained and each hand pose is recognized using a multi-class SVM algorithm. In this the hand poses are trained from numbers 1 to 9 with the help of the Support Vector Machines. If these hand gestures are used for entering the pin number, since the

naïve users may find it difficult to remember all the poses, we introduced all operations with the help of the virtual mouse.

[7] Computer Control through Touchless System Using Vision Based Hand Gesture Recognition - International Journal of Science and Research (IJSR) ISSN (Online): 2319- 7064 Index Copernicus Value (2013): 6.14 | Impact Factor (2013): 4.438

The primary step for the hand gesture recognition is the detection of the hand and segmentation of the corresponding image areas. After the detection, tracking is done which is the frame to frame correspondence of the hand regions or features towards the hand understanding of the hand movements. The overall goal of hand gesture recognition is the interpretation of the semantics that the hand(s) location, posture, or gesture conveys. In this the input video is partitioned into frames, for each frame, a set of features are extracted. After some preprocessing operations, the hand object is localised and segmented and the necessary features are extracted and stored in the computer as a trained set. Then each input image pass through the previous steps to extract its features, and classification algorithms are applied by comparing the extracted features from the input image with the training set, to interpret the gesture meaning according to a specific application .

[8] Cursor Control using Hand Gestures - International Journal of Computer Applications (0975 – 8887) Recent Trends

in Future Prospective in Engineering & Management Technology 2016

The objective of this paper is to Develop and implement a computer application that utilises alternate methods for cursor control. Thus, Proposes a novel vision based cursor control system, using hand gestures captured from a webcam by using colour detection technique. The

Goal of this paper is to create a system that will recognize the hand gestures and control.

The movement of the cursor was controlled by the tip of the index finger. In order to identify the tip of the index finger, the centre of the palm must first be found. The gesture recognition method used in the proposed design is a combination of two methods. The algorithm for the proposed gesture recognition method is described in the flow chart that can be shown below. It can be seen that the convexity defects for the hand contour must firstly be calculated. A new technique has been proposed to increase the adaptability and response time of the system. We have developed a system to control the mouse cursor and implement its function using a real time camera. Implementation of all the mouse tasks such as left and right clicking, double clicking and scrolling up & down, starting the applications using the gestures like notepad, paint, command prompt etc. This system is developed in such a way that the user, new to the system will just have to install the set up and not run the whole project. In this system, an object tracking based virtual mouse application has been developed and implemented using a webcam. The proposed system has been implemented in MATLAB environment using the MATLAB Image Processing Toolbox, Open cv library.

3. PROPOSED SYSTEM

In the proposed system we convert all the touch based operations into the touch less operations with the help of the virtual

mouse. The virtual mouse will be able to perform all the operations like left click, right click and the scrolling operation. Web camera captures the hand gestures and hand tip and then the virtual mouse application processes these frames to perform the particular mouse function to cursor operations such as left click, right click, and scrolling function and thus the

user can select any ATM operations on the screen visible.

The steps that are to be followed for performing the ATM operations are:

- User has to give the user id and password for login purposes instead of using an ATM card.
- If the login, password are authenticated then the user can perform the further operations.
- Select the type of transaction such as deposit, transfer, withdrawal of money using the hand gestures.
- Enter the withdrawal amount using a virtual keyboard.
- If the user performs any operations like withdrawal or deposit or fund transfer then the respective amount debited or credited details will be reflected into his account .
- The required operation can be performed and after completion of the transaction the user can continue performing other operations or it can be terminated.

4. SYSTEM ARCHITECTURE



Figure 4.1: Selecting the operations with the help of the virtual mouse

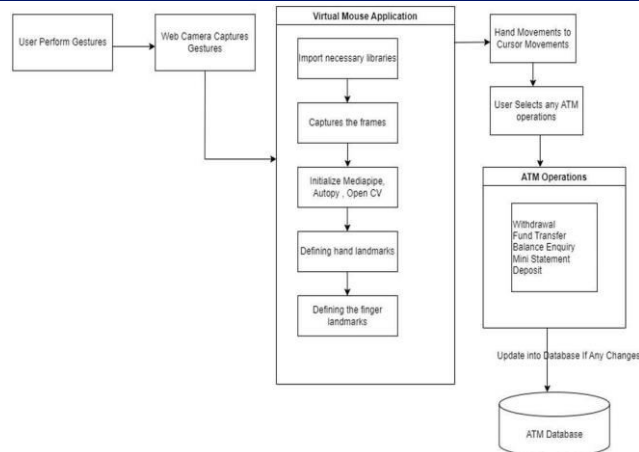
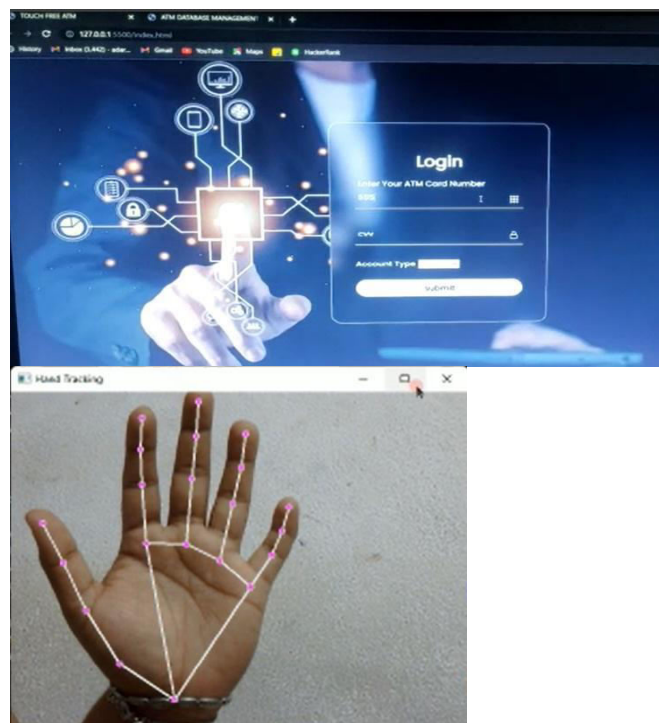


Figure 4.2: System Architecture of the Proposed System

RESULT

In this touch free ATM we will get the money without touching the screen. Everyone will be having the ATM credentials. By using this, we can log into the account.



CONCLUSION

Touchless technology is a branch of gesture control allowing users to perform operations without any use of physical contactless. Modern no touch

technologies are key factors to reduce the spreading of infectious diseases.

6. REFERENCES

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