Card Authentication Using Biometrics(Face)

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Abstract
This paper proposes a method for purchasing or transferring money using credit or debit cards which uses biometrics for authentication. We use facial recognition as biometrics for authentication. The algorithm we used is Haar cascades algorithm from OpenCV library. There are few problems faced by the credit a d debit card users such as cloning of the cards and obtaining the secret pin using the brute force technique. These frauds are more common in cases like losing of cards or the transaction that are done in public places like restaurants or malls etc. Our proposed method will be able to control few of these frauds by using facial authentication techniques. This systems works in the following manner the algorithm matches the face of the user who is accessing the card and with the collection of data sets which are available for that particular card holder account in the database. If the face is matched then the transaction will be accepted, if not the transaction will be denied.

1. Introduction

In the present situation, Many people are using credit cards and debit cards for doing their payments because it is easy to do and take less time. Online transactions made us very comfortable. Without struggling we are easily transferring the funds precisely and on time. So, the demand is increasing day by day for the online transactions but security issues are a big problem for everyone. So, the solution for this problem is using face detection and face recognition technique. The security issues are much reduced by this technique.

2. Organization of Paper

Section 1: In this section we provide the reason for which we took up this project and why this project is important. In section 2, here we provide the information about the previous projects done in this area and how we came up with the new solutions which are efficient than the ones used by others. In section 3, in this we provide information about the objective we acquire after completing this project. In section 4, in this section we mentioned about the project, how it works and what the needs to implement. In section 5 this part gives an idea about the two parts in the project which connects the different users in different situations. In section 6, here we discuss about the situations in which this project is used that is the applications of the project. In section 7, we present a conclusion about the Literature Review and the Case Study

3. Literature Survey

In 2019 Miss Mayuri Chavan[1]proposed an approach for "Credit card authentication using facial recognition" using Local Binary Pattern(LBP) and Cascade classifiers. Though local binary pattern is strongly built there are few disadvantages like it takes so much time to recognise the face hence we are using open cv.

In 2019 Akshay prakash.G[2] proposed an approach for "Credit card transaction using face recognition" using GLCM(Gray Level Co-occurance Method) Although it was easy to extract the features after converting into grayscale but the disadvantage is high dimensionality of matrix.

In 2018 Ahmet zdil Metin Mete zbile[3] proposed an approach for "Credit card authentication using facial recognition"using Eigen face Algorithm. Although this paper proposes principal component analysis. This method reduces the dimensions of an image butits disadvantage is finding eigen vectors and eigen values are time consuming. and the sizes, location of each face image must remain same as PCA approach.

In 2018 S.Gong.S.J.McKenna, and A.Psarrou[4] proposed an approach for "Credit card authentication using facial recognition"using Fisher face algorithm. Although it recognises the face correctly in a short period of time but the disadvantage is it requires large storage of images for better performance and its sensitive to lightening conditions and a lots of graphs have to be placed.

In 2018 Dr.Mohammed Sahib Mahdi Altael, Dua'a Ali Kareem proposed an approach for "GLCM Based LDA for Human Face Recognition" using GLCM. Although it was easy to extract the features after converting into grayscale but the disadvantage is its high dimensionality of matrix and high correlation of Haar like features.

4. Objectives

The main objectives of our project is to authenticate the face recognition along with OTP and pin during the transaction and to store the facial images in XML files and authenticate the user using facial images.

5. Methodology

Face Detection

Initial step is to create a system for detecting face using Haar cascades. Open CV contains a set of Haar cascades which are used in the project. Random objects are identified using face cascades and these also include eye cascades to get stable detection of face. In open cv, classifier class is used to create face and eye classifier objects through cascadeclassifier(). Using cascade classifiers videocapture() is used to capture images which creates camera objects.

Face Recognition Process

Haar cascade algorithm is used in this project. Open cv libraries are used to implement haar cascade algorithm. Facial recognition consists of three stages that are collecting image Ids, extracting unique features, classifying them and storing in XML files, and matching features of an input image with the features stored in the saved XML files.

Training the classifiers

By using open cv, xml files are created. They are created to store the extracted images using face recogniser class from database. The stored images are converted to grey scale and saved with the given IDs.

6. Module Description

Module 1: It is the Admin module. Administrator uses his/her login id, password and registers to the system . Administrator can make the changes in the system and does the registration of the users. In this module, the input image is cropped and features are extracted and stored in database.
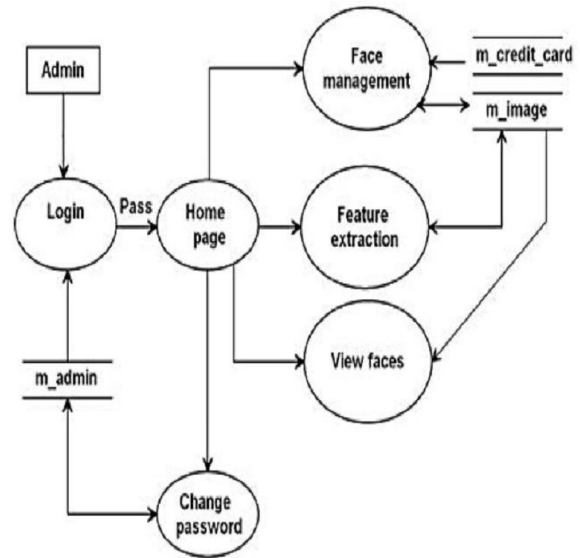

Figure 1: Admin Module

Module 2: It is the user module. Whole authentication process is done here. In this user module, the password of user is compared to password which is stored in the database. If the password entered is matched he/she can continue the transaction Orelse transaction is denied
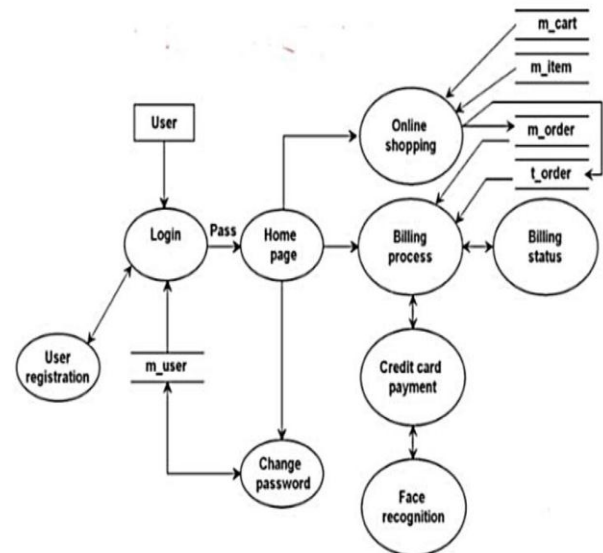

Figure 2: User Module

7. Applications

➢ This application can be used in shopping malls and , coffee shops etc..

➢ This can also be used in mobile applications while purchasing a product.

➢ This is used to secure online payments.

➢ This is used to prevent unauthorised access to the credit cards.

➢ This is used to prevent the brute force techniques to crack the passcode of the credit card.

8. Results

A. The given screenshot displays the web page where admin can login to the system.

Figure 3: Admin Login Page

B. This screenshot displays the face detection and feature extraction process, done by data stored in database.

Figure 4: Image upload and face detection

C. The user login to the system using the credential given at the time of registration.

Figure 5: Shopping Cart

D. This image shows the payment details. Here the details entered by user is matched with the details stored in database.

Figure 6: Payment Details

E. This image shows the process of comparing the user image with the image stored in database, that is the original image for user authentication.

Figure 7: Face Detection

F. If the user is genuine, he will be allowed to do the transaction. This image shows the payment confirmation.

Figure 8: Payment Confirmation

9. Conclusion

Our proposed system is designed for reducing the frauds related to credit or debit card users, which may occur during the online payments or a transaction done in public places like restaurants or shopping malls due to a lost card. This system is easy to implement which doesn't require high end hardware for installing. This only needs a computer which have a camera with good specifications. It is also a cost effective method. As the camera plays a pivotal role in this system the only thing we need to take care of is the camera quality and if there are any defects in the camera we have to check and change from time to time. The database should be managed according to the number of users increased and the database should be available for 24/7 in a week. We can still increase different modules until we reach an perfect identification. The comparison must be very fast and however, this lacks the property of comparing similar faces. Hence, there is still much more room for improvement.

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