# FRAUD DETECTION IN CREDIT CARD TRANSACTION USING FACE RECOGNITION TECHNIQUES

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**Abstract**

Credit cards are widely used around the world. People, who have the ability to buy anything they need with a price tag on the item, have many different ways to make payments such as online transactions, credit card transactions and monthly installments. Using credit and debit cards is becoming the most common payment method among a large number of buyers. In the credit card transaction, access is granted if one has a credit card and passes a verification. Such an approach poses several threats: unauthorized possession of credit cards (stolen or borrowed), clone card risk, etc. Credit card users face a number of privacy issues. This is most common when users give away their credit cards to unfamiliar people or lose their cards. One solution to minimize these threats is to verify the biometric relationship between the credit card holder's signed face image and the user's face image captured by a camera when using the card. The main objective of this research is to develop a software to reduce fraud transactions occurring through credit card payments using artificial intelligence to detect faces from a camera. This paper proposes a method for credit card transactions that combines face detection and face recognition technology.

**Key words:** face recognition, face detect, credit card transaction, fraud detection

## 1.Introduction

People have the right to buy anything with a price tag on the items they need. There are different ways of making payments. It will be a cash payment or a card payment. The seller who sells the product always expects the method of payment to be cash. This is because when the buyer gives the money and buys the product, the transaction closes immediately and the trader earns the value of the original profit, whether with real price or profit. The problem with the user having money is the chance to lose or steal. To overcome this problem, the new technology meant payment via credit card or debit card. Credit / debit card usage has increased in recent years. Credit cards are used worldwide. Credit and debit cards are becoming the most common payment method for a large number of buyers; pushing more and more businesses into credit card processing services. People use credit cards for online transactions, shopping malls, or cash from ATMs. Fraud is the biggest issue in credit card transactions. PIN codes of credit cards and debit cards can be stolen. Credit cards are stolen and used for large purchases, often causing great loss to the credit card processing service and business. Using credit cards for payments has important objectives such as minimizing fraud, enhancing credit card transactions security and ensuring customer confidence in the bank.

This paper suggests a new mechanism to prevent fraud in a credit card payment system. The authentication is done when the face of the payment handler is scanned using the camera. After scanning, the credit card data and the face of the person are compared to the database, and when both results are positive, the transaction closes successfully. This paper proposes a method for credit card transactions that combines face detect and face recognition technology.

## 2.Literature Review

Various literature discussed method for credit card fraud and face recognition. most of the method discussed in these literatures use more than one approach; it is not possible to do category wise discussion. different fraud detection and face recognition are discussed below.

New approach is provided that their experiments show that 150 images in the database and 10 images in the web-camera provide 100% accuracy in the process of detection. The running time in this case is 0.04 seconds. [1]. The identification process is implemented in conjunction with the SMGT and SNOW techniques with Eigen face calculations. They experimented with this technique with 150 front-facing images and a webcam stored face image. System detects 100% detection accuracy.

This research proposed a method for Robust Algorithm is presented for frontal face detection in color images. Face detection is an important task in facial analysis systems in order to have a priori localized faces in a given image. [2] This research discussed facial features such as eyes, nose and mouth are automatically detected based on the properties of the associated image zones

The proposed method provides high-level security, which includes OTP generation and face recognition [3].

This research discussed the system is adequately safe, reliable and usable. Installing the system on a banking software does not require special hardware. It can be built using a camera and a computer. Because The camera plays a crucial role in the operation of the system. Therefore, in real-time, the image quality and functionality of the camera should be carefully checked before performing the actual operation. [4].

In here discuss the face detection, feature extraction and face recognition [5]

New approach is provided that using automated reading of credit card details via a webcam and the use of face recognition technology, the credit card system is secured for online transactions. [6]

Study the patterns of credit card fraud. Banks can share their knowledge of fraud patterns in a heterogeneous and distributed environment, further enhance their fraud detection and reduce financial loss. [9]

Credit card fraud prevention is an important term for forecasting methods. [10] In the same year, is mainly focus on a comparative analysis of two feature extraction technique of face recognition PCA and LDA on different criteria like facial expression, illumination variant and glass – non glass for frontal face images. According to them, face recognition accuracy depends on two procedures that are human face detection and a feature extraction method

### 3.Existing system

The credit card issuer issues a credit card at the time or after the credit provider approves the account, and it should not be the same as the card issuer. Cardholders can use it to buy from merchants who accept the card. When making a purchase, the cardholder agrees to pay the card issuer. The cardholder prefers to pay by signing a receipt with a card description and specifying the amount to be paid, or by entering a PIN. Card data is obtained from a magnetic strip or chip on the card; The second method is known as chip and pin in the UK and Ireland and operates as an EMV card.
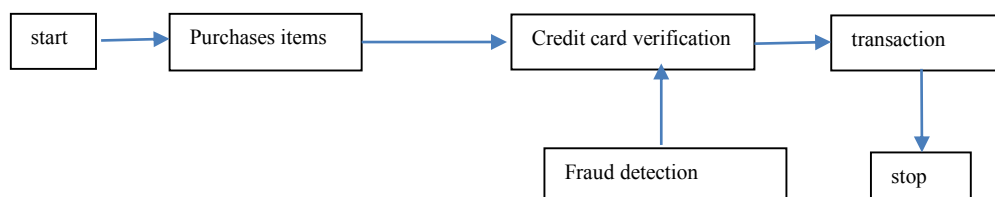
```
start  →  Purchases items  →  Credit card verification  →  transaction
                                        ↑                         │
                                        │                         ↓
                               Fraud detection                  stop
```

Figure 1: existing system architecture

**4. Proposed system**

Only the cardholder can use the proposed mechanism for payment. The user obtains a credit card from the bank and maintains it in the database such as cardholder name, bank account details, unique credit card number, credit card information, card verification value (CVV) number, valid thru time. In addition, a photo of the cardholder must be included in the database.

The credit card consists of multiple sections, such as the unique credit card number, cardholder's name and expiration date, and the credit card can be used in multiple posts, and finally, each credit card has a unique number on the back. This is called credit card verification value number or CVV. when we enter the credit card number into the system automatically we can get rest of details about credit cardholder. You can also see the image that was previously added to the database.

User face will be scanned using the camera and then features are extracted, the credit card data and the face of the person are compared to the database, and when both results are positive, the transaction closes successfully.
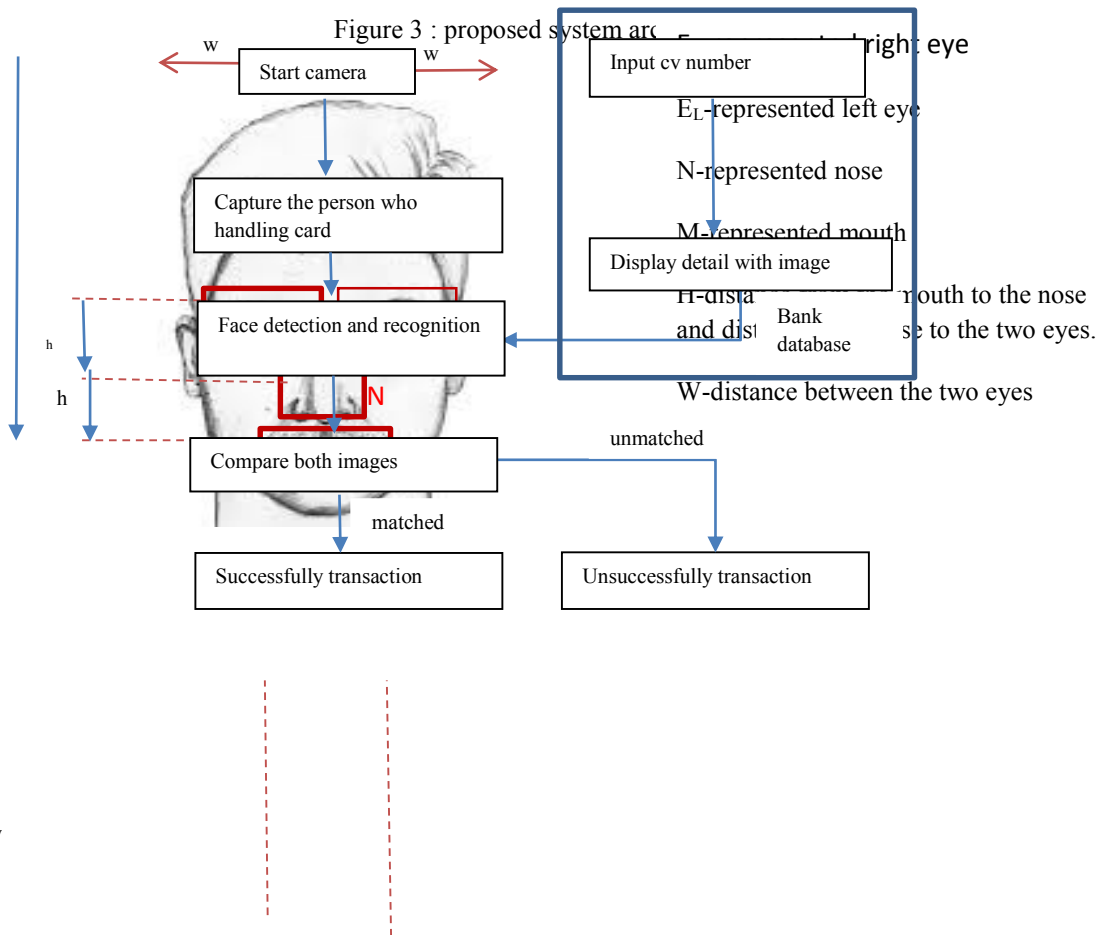


Figure 2: proposed system architecture (a)

**4.1System diagram**

## 5.Methodology

For the proposed system, we used a robust algorithm to detect the face from the color video that algorithms exist for identifying the front face of color images. Facial recognition systems are essential to establish the primary localized faces of a given image. Facial features such as eyes, nose and mouth are automatically detected based on the properties of the associated image zones. When detect a mouth, a nose and two eyes, a face validation step based on the eigenvalue theory that is applied to a normalized search space in the image relative to the distance between the eye points. Front face image contain two eyes, a nose and a mouth. Frontal face is shown figure 4.

Figure 3 : proposed system arc

$E_R$-represented right eye

$E_L$-represented left eye

N-represented nose

M-represented mouth

H-distance from mouth to the nose and distance nose to the two eyes.

W-distance between the two eyes

Start camera

Capture the person who handling card

Face detection and recognition

Compare both images

matched — Successfully transaction

unmatched — Unsuccessfully transaction

Input cv number

Display detail with image

Bank database

3w

Figure:4

Structural relationships provide useful information about the appearance of a frontal face images such as the Euclidean distance between the mouth, the nose and the left and right eye, the angle between the eyes, the nose and the mouth. These structural relationship of facial features are generally useful in limiting the process of facial recognition. If the input image from the camera is a color image, the color information is used for the preprocessing step. Candidates for the facial region are obtained using the Facial Color Chromosome Property. This step effectively reduces the search range of the images, thereby reducing the computing time required to detect facial features.

Color video → Skin detection → Facial feature detection → | Eye    Nose    Mouth    detection | → Eigenvalue face verificatio → Detect facial feature
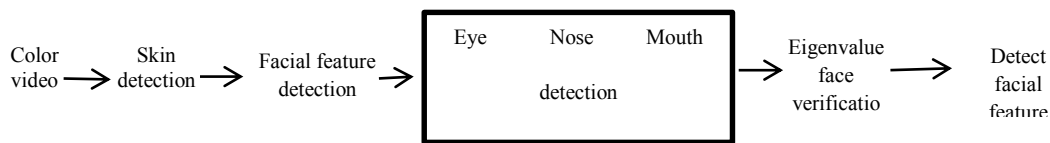
Figure 5: Face detection

The face detection system is shown in Figure 5. first task is skin detection. In here, identify the skin by using a statistical skin recognition model through color video. Then identifies facial features based on image pixels and the corresponding color segmentation regions. Then the eye and another T points relative to the position of the eye is detected 70 facial feature points.
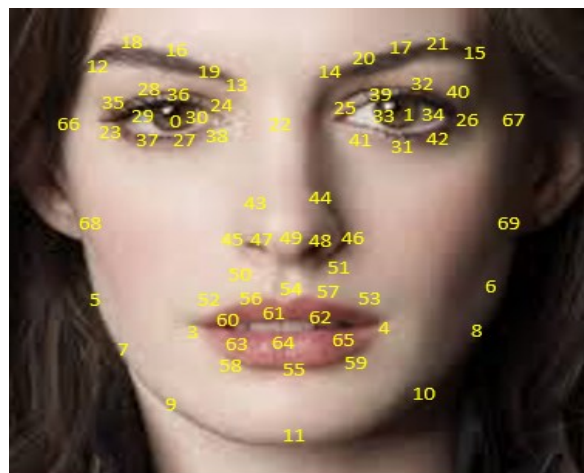


Figure 6: Seventy features point

Table1: Facial feature name with value

| Value | Facial feature name |
|---|---|
| 0 | Left eye |
| 1 | Right eye |
| 24 | Left eye inner corner |
| 23 | Left eye outer corner |
| 38 | Left eye lower_line1 |
| 27 | Left eye lower_line2 |
| 37 | Left eye lower_line3 |
| 35 | Left eye upper_line1 |
| 28 | Left eye upper_line2 |
| 36 | Left eye upper_line3 |
| 29 | Left eye left iris corner |
| 30 | Left eye right iris corner |
| 25 | Right eye inner corner |
| 26 | Right eye outer corner |
| 41 | Right eye lower_line1 |
| 31 | Right eye lower_line2 |
| 42 | Right eye lower_line3 |
| 40 | Right eye upper_line1 |
| 32 | Right eye upper_line2 |
| 39 | Right eye upper_line3 |
| 33 | Right eye left iris corner |
| 34 | Right eye right iris corner |
| 13 | Left eyebrow inner corner |
| 16 | Left eyebrow middle |
| 18 | Left eyebrow middle left |
| 19 | Left eyebrow middle right |
| 12 | Left eyebrow outer corner |
| 14 | Right eyebrow inner corner |
| 17 | Right eyebrow middle |
| 20 | Right eyebrow middle left |
| 21 | Right eyebrow middle right |
| 15 | Right eyebrow outer corner |
| 2 | Nose tip |
| 49 | Nose bottom |
| 22 | Nose bridge |

| 43 | Nose left wing |
|---|---|
| 45 | Nose left wing outer |
| 47 | Nose left wing lower |
| 44 | Nose right wing |
| 46 | Nose right wing outer |
| 48 | Nose right wing lower |
| 3 | Mouth right corner |
| 4 | Mouth left corner |
| 54 | Mouth top |
| 61 | Mouth top inner |
| 55 | Mouth bottom |
| 64 | Mouth bottom inner |
| 56 | Mouth left top |
| 60 | Mouth left top inner |
| 57 | Mouth right top |
| 62 | Mouth right top inner |
| 58 | Mouth left bottom |
| 63 | Mouth left bottom inner |
| 59 | Mouth right bottom |
| 65 | Mouth right bottom inner |
| 50 | Nasolabial fold left upper |
| 52 | Nasolabial fold left lower |
| 51 | Nasolabial fold right upper |
| 53 | Nasolabial fold right lower |
| 11 | Chin bottom |
| 9 | Chin left |
| 10 | Chin right |
| 7 | Face_contour1 |
| 5 | Face_contour2 |
| 6 | Face_contour12 |
| 8 | Face_contour13 |
| 66 | Face_contour14 |
| 67 | Face_contour15 |
| 68 | Face_contour16 |
| 69 | Face_contour17 |

## 6.Result and Discussion

Facial recognition identifies the customer's face and details. The performance returns confidence levels for every customer within the output string. Here the image taken by the camera is detected by the green color rectangle frame. If that image already exists in the bank database, the relevant number is given by the camera. This is shown figure (7). It is shown as a Customer ID which belongs to the string data type. The credit card details of the customer ID are displayed on the computer monitor such as computer name, account number, credit card number and validity period. Then we can compare the image that the camera detects and the images stored in the database. In this system face recognition have more accuracy. This system will work according to bank database.
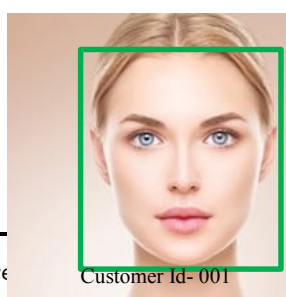

Customer Id- 001

Figure 7

## 7.Conclusion and future work

This paper presents Fraud detection in credit card transactions which has the ability to provide a great experience for the customer and also for the cashier. Face detection technology provides the capabilities of detection and recognition of human faces on facial features. The system provides highly accurate results and better performance. The system has the ability to identify credit card holders and providing benefits to bank to ensure the customers faith on the bank. Fraud detection in credit card transactions using face recognition provide a higher level of security and also Credit card fraud can be prevented. It is more secure than the existing system. This system, easy to use third party. As technology grows, there are many changes across the entire system, and most importantly, the security of each component. In this proposed system, a cashier must enter the CV number for cardholder information. We intend to use the scanner instead of the cv number. This scheme is only for shopping malls. But we hope to expand it to movie theaters, hotels and other credit card transactions.

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