

# Signature Scrutiny System in Banking Application

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**Abstract:** *In today's world security is very important. An integral part of security is authentication as based on a person's identity he is authorized to certain privileges. There are many means for authentication, and signature is one among them. Since decades, signatures are considered as a means of authentication and 'seal of approval'. An important advantage of the signature verification compared with others is its long tradition in many commercial fields such as e-business, which includes online banking transaction, electronic payments, access control and so on. In banks whenever a person wants to carry out any financial transaction the signature is used to verify the identity of the person. To date signatures verification is done manually in banks where a person manually verifies the signature on the cheque with specimen signature. But this method is not accurate as naked eye cannot detect forgeries. Our proposed system deals with computerized signature verification in banking application. In banks signature verification comes into picture when any transaction is carried out.*

**Keywords:** Security, Signature Verification, Transaction, Banking, Authentication.

## 1. Introduction

As signatures continue to play an important role in financial, commercial and legal transactions truly secured authentication becomes more and more crucial. For instance, financial institutions rely on them for account openings, withdrawals and transaction payments. In legal aspects such as in property related matters signatures play a vital role. On the other hand the threats and monetary losses continue to rise dramatically; in particular check frauds have reached epidemic scope. Any process that requires a signature is a prime contender for signature identification. Individuals are less likely to object to their signature being confirmed as compared to other possible authentication systems.

Signature verification is broadly classified into two types namely: Online (dynamic), Offline (static) signature verification. In Online the verification is based on dynamic characteristics of the process signing and a person uses a special pen called stylus to create his/her signature. While signing many parameters are calculated such as total signature time, RMS speed, average horizontal speed, length to width ratio, horizontal span ratio, first moment etc. All these parameters are stored in the data base along with the signature. Next time when authentication is required the person is again asked to sign on the writing pad where again these parameters are calculated and compared against the stored values. If these parameters match the signature is accepted where as in offline the signature is made by a normal pen. Here from the scanned image of signature the static features are calculated such as height of the signature, width of the signature, distance between certain nodes, angle of inclination, length of the longest stroke. The specimen signature of the customer is stored in the database. Next time when authentication is required the person is asked to sign again. While static signature verification is most suited technique for reducing fraud through payment forms such as cheques, fax money transactions, payment orders at the back office operations. The recently introduced technology of dynamic signature verification via online

capturing using pressure sensitive pen pads, tackles ideally the threats at tell front end.

## 2. Related Works

Many have carried out research on Handwriting and Signatures as they play a very vital role in the identification of an individual. Finger prints, iris off course form basic forms of identification but signatures are the most common one which are being used since old days for authentication and identification of a individual specially in financial cases. Therefore work in this particular stream is speeding up. Thomas. G. Zimmerman, Gregory. F. Russell, Andre. Heilper, Barton. A. Smith and Jianying Hu have proposed Retail applications of signature verification. The Dramatic rise in identity theft, the ever pressing need to provide convenience in checkout services to attract and retain loyal customers and the growing use of multi-function signature captures devices in the retail sector provides favorable conditions for the deployment of dynamic signature verification (DSV) in retail settings[6]. Similarly Mahammud Faisal Zafar et al have carried out research on online handwriting character recognition: an implementation of counter propagation neural net [7]. A research work has been carried out by Emre Ozgunduz et al on off-line signature verification and recognition by support vector machine [8]. Shohel Sayeed et al have worked on Forgery detection in dynamic signature verification by entailing principal component analysis [9]. This shows that research on both on-line and off-line signatures and handwriting have been the top priority of researchers as it has gained a lot of importance as fingerprints, iris and face identification.

## 3. Future Scope of Signature Verification

Full adaptation of this technology has been slow in the many industries that are natural candidates of signature verification technology, such as financial industry. Chase Manhattan bank was the first bank to test a signature identification application. Other examples include:

- Internal Revenue Service has utilized signature identification in electronically filed tax returns.
- Employment services in England to verify an individual that is claiming benefits.
- Pharmaceutical companies are using it to reduce the overall cost and administration of drug regulatory submission to the FDA.
- Penton ville prison in England is employing signature identification to prevent prisoners signing off food against other prisoner's accounts. It has also been successfully tested on visitors to the prison.

Like this signature identification will continue to grow and become more of an everyday occurrence in our society because of high public acceptance and its efficiency, which are the major advantages it holds over other biometric technologies. Two examples of new applications in the works for signature identification is the healthcare industry is adopting signature identification for the submission of new drug applications, and the computer industry is using signature identification for computer systems access.

#### 4. Features of Proposed System:

##### 4.1 Create new account

Customer can open two types of accounts namely savings and current account. While creating a new account the personal details of the person along with his three specimen signatures are stored in the database.

##### 4.2 Deposit:

Once a person has opened an account he can deposit money into his account. The minimum balance to be maintained in an account is Rs.500.

##### 4.3 Withdraw:

Whenever a person wants to withdraw money from his account he has to issue a cheque here signature verification comes into picture. The signature on the cheque is scanned and it is matched with the specimen signature of the customer which is stored in the database. If these two signatures match, the transaction is allowed or else it is rejected.

##### 4.4 Change Signature:

Using this option the customer can change his specimen signature.

##### 4.5 Update details:

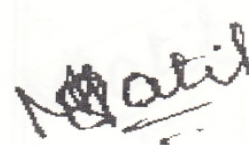
Using this option the administrator can update the personal details of a customer.

##### 4.6 Search:

The administrator can view the details of the required customer or account using this option.

#### 5. Proposed System

Step1: A specimen signature is taken along with current signature for verification.



Step 2: The topmost point, bottom point, the start and end points are found for both the signatures.

Step3: With the help of these nodes, the height and width of the signatures are found.



Step4: If the difference between height and width of the two signatures crosses a given limit then the signature is rejected at that moment.

Step5: If the signature is not rejected then distance between nodes are calculated. Once again the difference between these distances of the signatures is calculated and checked against a certain limit. If difference is above the limit signature is rejected.

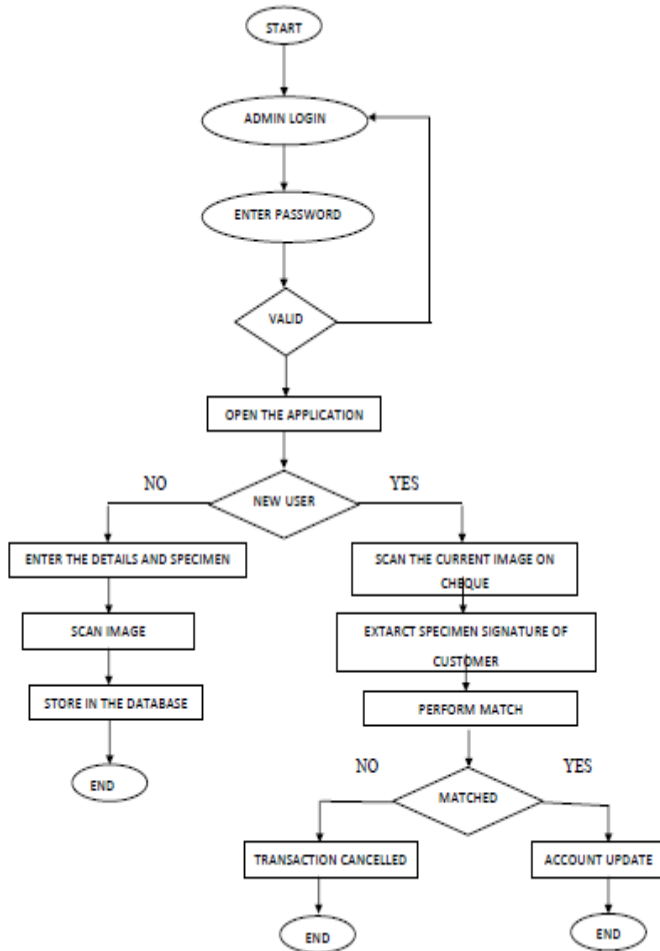


Step 6: In the next step, we take four segments of size 30 \*30 as shown in figure.



Step 7: The segments are compared pixel by pixel and percentage of match is calculated. If the average percentage of the four segments is less than 85% then the transaction is rejected.

### 6. Data Flow Diagram



### 7. Results:

**Register**

Enter customer ID:

**ADDRESS**

Name:  House No.:

Gender:  Street:

Occupation:  City:

Education:  State:

Phone No.:  PIN:

Please enter the following details

Account No.:  Speciman signature:

Account Type:

Date of Opening:

Figure1. User Registration Form

**Authenticate**

Please enter the account no. for signature verification:

Applicant's name:  Customer ID:

Current Balance:

Speciman Signature:  Percentage:  Current Signature:

Please enter the following details

Amount to be withdrawn:  Date of withdrawal:

Payee's Name:  Balance after withdrawal:

Cheque number:

Figure 2. User Authentication Form

**Change signature**

PLEASE ENTER THE CUSTOMER\_ID WHOSE SIGNATURE IS TO BE CHANGED

ENTER THE CUSTOMER ID:

EXISTING SIGNATURE:  NEW SIGNATURE:

Figure 3. Change of Signature

### 8. Conclusion and Future Work

This proposed application deals with basic requirement of signature verification in bank. It also helps in carrying out the basic transactions of the bank such as opening a new account, depositing money and withdrawing amount. It also maintains detailed information of the customers of the bank. We can include joint account feature also but many more static parameters can be calculated and efficiency of the algorithm can be increased. Advancements in technology have made the job of people, who breach the security systems easier. This calls for very secure systems, which are difficult to break. The latest technology in this field is Biometrics. Biometrics takes into account the biological characteristics of the person, which are unique to a person for authentication. This makes the job of the person who wants to hack the system very difficult. One such biometric is signature and handwriting. There are many means of

authentication such as fingerprints, iris, face etc. signature is one of them which is being implemented in this paper. With more and more research work on the arena signatures can be used better for authentication.

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