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Signature Matching for Bank System using Neural Network

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***Abstract*: Signature is a behavioral trait of an individual and forms a special class of handwriting in which legible letters or words may not be exhibited. The purpose of this paper is to design a new system to make the verification of signatures size and angle invariant for cheque system. The invariance can be achieved by scaling and rotational manipulations on the target image. That is the number of crests, toughs and curves remains the same irrespective of the size and orientation of the image. The ratio between consecutive crests and troughs there by remain the same and hence can be used to determine the genuineness of a signature. This system will be used in financial and business to automatic signature verification. It includes weather signature is matched or unmatched and also contains the amount of signature matching percentage**

***Keywords*: Edge detection, Gray scaling, Image processing, neural network, prewitt algorithm.**

1. Introduction

Signature verification is an important research area in the field of person authentication. A signature is treated as an image carrying a certain pattern of pixels that pertains to a specific individual. Signature verification problem is concerned with examining and determining whether a particular signature truly belongs to a person or not. Signatures are a special case of handwriting in which special characters and flourishes are viable. Signature verification is a different pattern recognition problem as no two genuine signatures of a person are precisely the same. There are two approaches used for signature verification according to the acquisition of the data as offline and online signature verification system. In offline verification system, only static features are considered, whereas in case of online systems, dynamic features are taken into consideration.

In the following sections, we describe the introduction of system for dynamic signature verification. In section 2, System architecture and pre-processing is discussed followed by feature extraction in section 3 explains the flow chart of signature matching and working of the system. And then the experimental results are given at the end of section 3. Section 4 gives advantages of signature matching finally the conclusions are presented in 5.

2. System Architecture

Online verification methods can have an accuracy rate of as high as 99%. The reason behind is its use of both static and dynamic (or temporal) features, in comparison to the offline, which uses only the static features The major differences between offline and online verification methods do not lie with only the feature extraction phases and accuracy rates, but also in the modes of data acquisition, preprocessing and verification/recognition phases, though the basic sequence of tasks in an online verification (or recognition) procedure is similar to that of offline.

A. Signature verification methods

1) Offline Signature methods

Offline methods use static information's for verifying the signature. Offline signature schemes use the signature as the input image and are used in the verification of bank cheques. Offline signatures usually have noise present in them. So, it is necessary to apply filters to remove the noise from the signature after processing the input image.

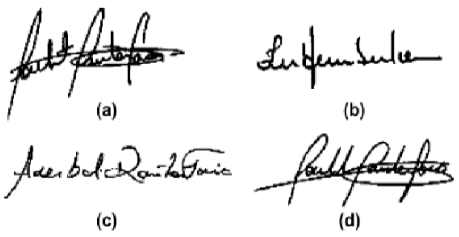


Fig. 1. Offline signatures

2) Online Signature methods

Fig. 2. Online signatures

Online methods use dynamic information's for verifying the signature. Online signature methods are usually carried with the help of devices like pressure-sensitive tablets and webcam that extracts features from a signature. They are employed in real-time applications for eliminating fraud. They are used in

computers for accessing sensitive data, Forensic applications and in credit card transactions. Online signature methods have high accuracy and are very cheap to implement.

3. Flowchart of the System

A. Gray Scale conversion

Comparing and verifying an image having multiple color strains is pretty complex. So, the gray scale format of scanned image is obtained by using predefined functions of image processing.

B. Binaries

In this a uniform image pattern is created in which all shades from black to gray are colored black and the rest area colored white. There are 256 gray levels of a gray scale image. Here there is a need of binary image having only black and white values.

C. Edge Detection

Edge detection is a fundamental tool for image segmentation. Edge detection methods transform original images into edge images benefits from the changes of grey tones in the image. Edge detection is used for object detection which serves various applications like medical image processing, biometrics.

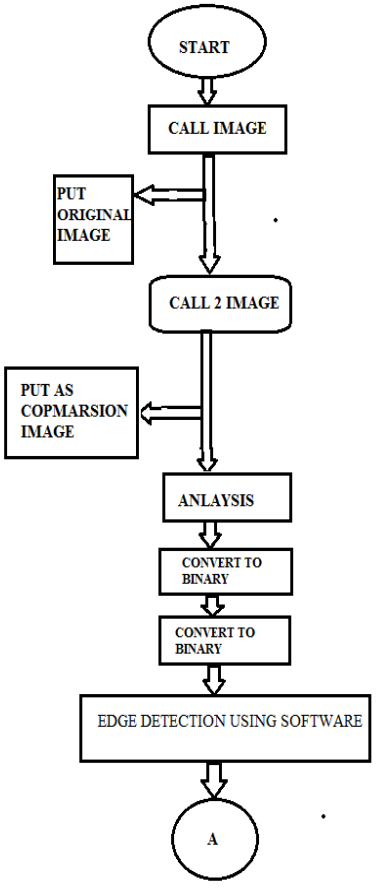


Fig. 3. Flowchart of signature matching

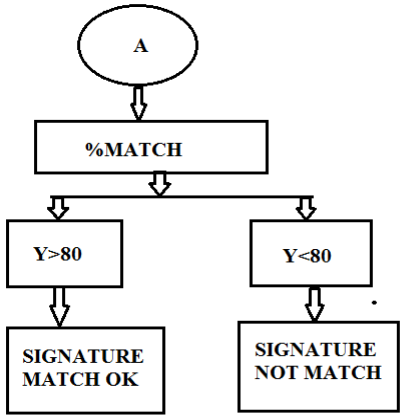


Fig. 4. Flow Chart of the GUI of the system

In fig. 4, shows the flow chart of the GUI of the system in which two signatures are selected and check whether the signatures are matched or not and also shows the % of signature matching.

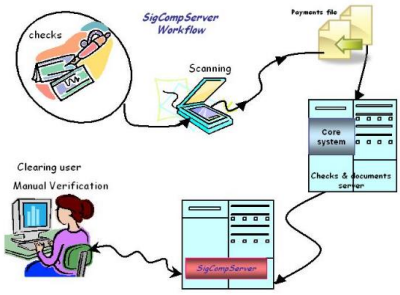


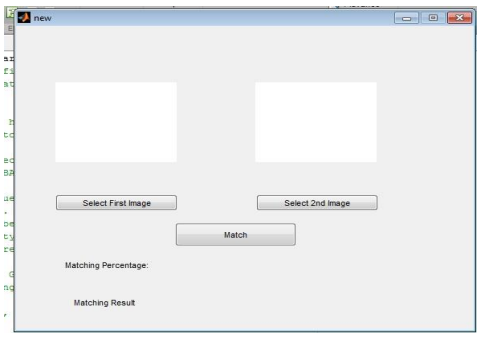
Fig. 5. Signature Verification Flow

D. Signature matching

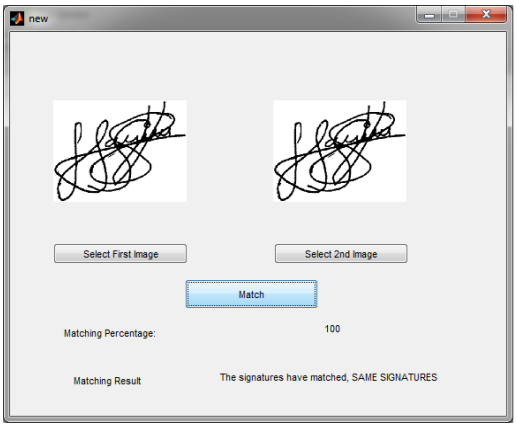
Signature verification is a technique used by banks, intelligence agencies and high-profile institutions to validate the identity of an individual. Signature verification is often used to compare signatures in bank offices and other branch capture. An image of a signature or a direct signature is fed into the signature verification software and compared to the signature image on file.

E. GUI of the System

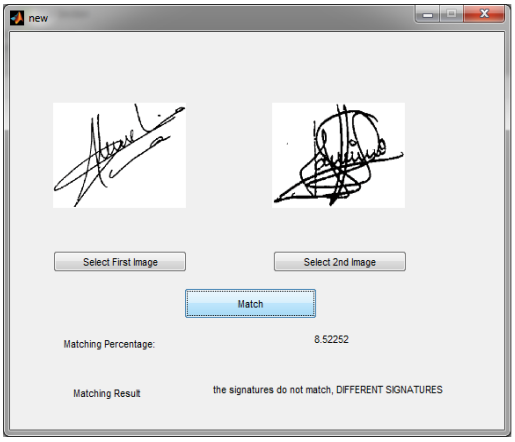
Step I:



Step II:



Step III:



4. Advantages

1) Already acquired in a number of applications such as bank cheque system, digital signature for number of applications.
2) Acquisition hardware:
   Off-line: ubiquitous (pen and paper).
   On-line: inexpensive and already integrated in some devices (TabletPC).
3) User-friendly, well accepted socially and legally

5. Conclusion

A reliable signature verification system is an important part of law enforcement, security control and many business processes. It can be used in many applications like cheques, certificates, contracts etc. The integrated signature verification system incorporates database management, noise removal and pre-processing, feature extraction, learning and verification modules. The matching is done and decision making is based on threshold based technique that gives near applications. The system showed promising results. Different threshold values are used for matching depending on testing and training features vectors, thereby boosting the overall performance of the system. This work is used to scans the cheque and tell whether the cheque is bounced or cleared. It verifies the account no from database & then verifies signature from masters & puts the output of matching in percentage. After that the amount is deposited or withdrawn from the respective account.

References

[1] Kishor T. Mane, Vandana G. Pujari "Signature Matching with Automated Cheque System" International Conference on Intelligent Systems and Signal Processing (ISSP) 2013.
[2] Babita P (2015) Online Signature Recognition Using Neural Network. J Electr Electron Syst 4: 154.
[3] Veena N, Mrs. Prathiba M K "Handwritten Signature Verification Using Neural Network" International Research Journal of Engineering and Technology (IRJET) 2016.
[4] Gopichand G, Sailaja G, N. VenkataVinod Kumar, T. Samatha "Digital Signature Verification Using Artificial Neural Networks"International Journal of Recent Technology and Engineering (IJRTE), Volume-7 Issue-5S2, January 2019.
[5] Kanawade M. V., Katariya S, "Review of Offline Signature Verification and Recognition System," IJETAE, Volume 3, Issue 7, July 2013.
[6] Banshidhar Majhi, Y. Santhosh Reddy, D. Prasanna Babu, "Novel Features for Off- line Signature Verification," International Journal of Computers, Communications & Control, Vol. 1 No. 1, pp. 17-24, 2006.