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Review on Offline Signature Verification by SVM

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Abstract – *Signature is an identification in authorizing a cheque or any document for any person. Now a days, forgery by false signature is becoming very common, which is illegal. In order to avoid such kind of forgery there are various methods incorporated in today's scenario. Signature verification is categorized as static (offline) and dynamic (online). This paper presents a flow chart which represents how the verification is done in previous years, also introduce the SVM.*

Key Words: **SVM, Signature Verification, forgery, feature extraction, online signature, offline signature, Biometric system**

1.INTRODUCTION

Signature Verification is a methodology of observing an individual's duplicate marks. Signatures have been by a long shot the most mainstream means for distinguishing the genuineness of person. Signature confirmation offers a bustling, basic means for accepting the legitimacy between a fake one and unique one. The most generally utilized methodologies for the confirmation of the marks are static and dynamic. Changing or online verification investigates the behavioural biometric of the manually written mark while it is being composed with the point of checking it credibility, therefore, securing the character of the client.
Online signature verification can helpfully use various parameters connected with the stylus and electronic composition cushion for deciding the validness of the mark. These parameters incorporate pace, height, breadth of the signature, number of pen ups and pen downs, distance of the signature and so forth. These properties make tge signature unique and nearly impossible to forge.
The kind of verification technique online can likewise differ contingent upon the kind of use. For banks and other financial establishments, online signature check is not possible. At the point when check and different reports touch base for freedom at the banks end, disconnected from net check gets to be obligatory, as the client is definitely not present at the time. This obliges a database of marks to be given to the banks. Check extortion recognition is one of the biggest difficulties confronting organization and monetary establishments today. I.T sector adds to most of the misfortunes endured by the bank. False checks are so troublesome it couldn't be possible to distinguish for gifted frauds.

2. Literature Survey

Vast research has been done and research is going on in the field of signature verification or to less down or cut down the forgery cases in banks, etc. Following is the literature survey done in the field of offline and online signature verification by different methodologies. Some of the papers are represented below.

In [1] "Offline Signature Recognition Using Global Features", the authors Ms. Pallavi Patil, Ms. Archana Patil, presents the method which is most popular biometric methods in the field of authentication of personal. In this Global features are extracting main features like area, height and breadth. Euclidean distance model is used while finding match between test signature and signature stored in the database. The algorithm gives 89% satisfactory results of the recognition by the proposed method in this paper.

In [2] "Signature Verification system Based On Support Vector Machine Classifier", the authors Ahmed Abdelrahman, Ahmed Abdallah, represents an offline signature verification system using Support Vector Machine technique, global features abstracted from the signatures using random transform. For every registered user, database is maintained. Two signatures are aligned using dynamic time wrapping algorithm, 82% satisfactory results were achieved by this method.

In [3] "Offline signature Verification Based on SVM and Neural Network", the authors Anjali.R, Manju Ram, represents in this paper the measurement of grey level features of an image when it is distorted by a complex background and train by using neural network classifier and SVM. The image is trained by neural network by using feed forward back propagation algorithm and SVM. Removed and reduced the background complexity using grey level features. Proposed to identify the skilled forgery to increase the performance of the system.
In [4] "Survey on Offline Handwritten signature Verification", the authors, Prof. Laxmikant Malphadwar, Comparison between online and offline signatures is done and the author concluded that online signatures are found to be more complex due to the non-appearance of stable dynamic characteristics and also due to highly unconventional and stylish writing styles. There are False Acceptance Rate (FAR), False Rejection Rate (FRR). Offline

signature Identification methods give flexibility and disadvantages of both online and offline signature identification methods are described by the author in this paper.

In [5] "Signature Verification Using SVM", the authors in this paper highlights the development of online signature verification system using SVM and VB Tablet 2.0 to verify the input signature by comparing database. This may take place by signing directly on to a digitizing tablet by using stylus which is connected to the Universal Serial Bus (USB) port of computer. The signature is characterized as pen-strokes consisting x-y coordinates and the data will be stored in the signature database in the form of a txt.file .

3.PROPOSED ALGORITHM

Distinguishing the genuineness of the signature an algorithm is proposed which has following steps:

i. Collection of the sample signatures and pre-process them.
ii. Adding the reference signature from the database of the images of signatures.
iii. Find out the reference signature from the sample of signatures.
iv. Load the signature from the database of the images.
v. Load the matching purpose image from the database of the images.
vi. Find the feature extraction of both the images by the matching process.
vii. After the extraction process make the grid feature extraction for finding the feature of the images and recognition of the signature using fuzzy logic based system and SVM.
viii. Enhance the percentage of genuineness than obtained previously.

Flow chart is also represented further which basically give the clear pictorial representation for how the signature verification is carried out.

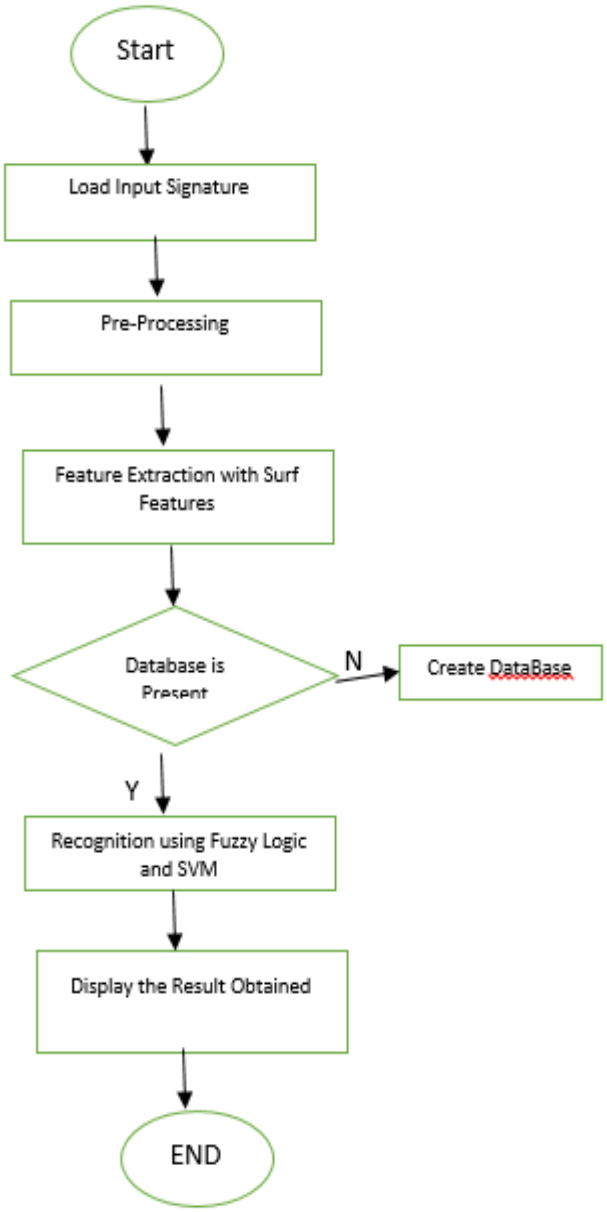

Fig -1: Flow Cart for the Signature Verification

Above flow chart shows how the extraction is done and with the result recognition is done for the genuineness of the person. Following is the description of the steps in flowchart:

i. Load input signatures
ii. Pre-Processed it and then extract features with surf feature.
iii. Check whether the database is present or NOT. If not, then create the database and if YES, then go further step.
iv. In this recognition using Fuzzy Logic and SVM classifier.
v. Display the results obtained.

3. CONCLUSION

Signatures are very important for the authentication of a person in banks or offices etc. Various automated systems are coming into picture for the verification of the signatures. Technology is improving day-by-day in the field of authentication as the forgery cases are also been experience a lot. Offline signature verification is less complex as compared to online signature verification. Stable dynamic characteristics are recognized with the help of SVM classifier. Various steps are studied in verification of signature. Analysis on FRR and FAR can also be done for their efficiency to get better results.

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