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Study on Image Processing Based Sign Lock Verification System

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ABSTRACT

The signature verification is the behavioral parameter of biometrics and is used to authenticate a person. A typical signature verification system generally consists of four components: data acquisition, pre-processing, feature extraction and verification. Very large percentage of daily financial transactions is generally carried out on the basis of verification of signatures. Therefore signature plays an important role both for authentication and authorization of any legal documents. Many documents, such as forms, contracts, bank checks, and credit card transactions require the signing of a signature. Therefore, it is of upmost importance to be able to recognize signatures accurately, effortlessly, and in a timely manner. In this paper we will describe the different methods by using which we can easily verify the signature of individual user in this paper, the use of One-Class Support Vector Machine (OC-SVM) based on writer-independent parameters, which takes into consideration only genuine signatures and when forgery signatures are lack as counter examples for designing the HSVS (Handwritten Signature Verification System).

Keywords: Feature based techniques, Function based technique, thrusters based technique, colour based technique, SVM, HOG

I. INTRODUCTION

Biometrics is one of the most widely used approaches for person identification and authentication. In Offline arrangements shape of the signature is acquired from the scanning process and corresponding features are derived from the scanned picture of the signature In legal transaction signature plays a significant role. So it is necessary to develop an efficient handwritten signature verification system.

The objective of signature verification is to classify genuine or forged signature Depending on the extracted data from the signature there are two kinds of verifications are used namely offline arrangement and online arrangement. However, aiming at providing reliable and privacy-proof authentication solution, authentication methods relying on personal motion trajectory like signature or gait may be better than those requiring clients to submit more private information. Usually, the handwritten signature is the legal and social acceptance by many people. thus, two acquisition modes are used for capturing the signature: off-line mode and on-line mode.

The off-line mode allows generating a handwriting static Image from a document scanning. Indeed, the handwritten signature remains important for many government/legal/financial transactions such as office automation, validation of cheques, credit cards, historical documents. In order to enhance

the performances of both handwritten signature verification systems, we propose a combination. Signature recognition can be split into two categories: Static: In this mode, users write their signature on paper, digitize it through an optical scanner or a camera, and the biometric system recognizes the signature analysing its shape. This group is also known as "off-line". Dynamic: In this mode, users write their signature in a digitizing tablet such as the device, which acquires the signature in real time. Off-line systems are used for hard copies of signatures available.

Figure 1. Different Signature

The signature features such as ballistic motion, information in stroke segments, stroke elements, local shape descriptors, pressure, height and area, vertical and horizontal projections, edge points, smoothness, aspect ratio etc., are fed to the classifiers to judge the validity. Signatures normally are affected by physical and emotional state of the writer. The signatures are different case of handwriting which incorporates the intrapersonal variations and interpersonal differences. Automatic signature verification system and recognition system has many applications as a symbol of consented authorization, especially in the case of credit card validation, cheques, land purchases, legal documents, and security systems.

II. RELATED WORKS

In [1] Prathiba M K and Dr.Basavaraj L has discussed about online signature systems developed either feature based or function based systems. The function based systems uses local information it can be directly obtained from the acquired signature time functions like Point wise horizontal and vertical points, point wise pressure, etc. for verification. In feature based systems, global information extracted from the signature such as number of pen ups, signature duration, Signature height/width ratio, Average velocity etc. global information is derived from the local information of the signature.

In [2] Moises Diaz, Member, Andreas Fischer, Member, Miguel A. Ferrer, and Rejean Plamondon, This paper belongs to the active research field of automatic handwritten signature verification. Many techniques have been explored to solve the problem of signature verification, the vast majority of which have been discussed in comprehensive surveys. Although most methods have achieved reasonable levels of performance, there are few examples in the literature of the use of an SRSS for verification purposes.

In [3] Nan Li, Jiafen Liu, Qing Li, Xubin Luo and Jiang Duan. In general, signature verification methods are mainly divided into 2 categories: offline verification and online verification. Offline signature verification mainly uses static graphic information to authenticate signer. While online signature verification can make use of more dynamic information, such as velocity, acceleration and pressure of writing a signature, which is more difficult to imitate. Hence online signature verification generally has higher accuracy rate than offline verification.

In [4] Alan McCabe and Jarrod Trevathan HSV is still a relatively new application area for HMMs, with few truly intensive investigations being reported in the literature. Some of the more landmark studies with HMMs in HSV are presented here. The basic approach to HMMs involves performing stochastic matching of a model and a signature using a sequence of probability distributions of the features along the signature. The signing process is usually modelled with several states that constitute a Markov chain,

each of them corresponding to a signature segment. The states are generally not directly observable (i.e., they are hidden) and only the signature's local features (such as tangent angles) can be observed.

In [5] Shashikumar D. R, K. B. Raja, R. K. Chhotaray, Sabyasachi Pattanaik It is used feature extraction methods with K-Nearest Neighbour for signature verification. Grid, Global, and Texture Feature Comparison are the three kinds of features used for signature verification. In the grid-based features, a signature image is divided into rectangular regions and ink distribution in each region is evaluated. In the global feature comparison, a number of features extracted globally from the whole signature are compared. The texture-based features comparison is based on the co-occurrence matrices of the signature image.

III. COMPARATIVE ANALYSIS

In this part of the paper describe about the different methods comparative study using its advantages and limitation so we can find the batter among all.

Table 1. Feature Based Comparative Analysis

Methods	Advantages	Disadvantages
HOG	The HOG system find its important while using above mention extraction techniques in unison.	By far the best method devised is offline signature verification using neural network.
LBP	Faster in speed of the recognition process.	Less accurate.
PCA	More accurate.	The covariance matrix is difficult to be evaluated in an accurate manner.

TABLE 2 . CLASSIFICATION BASED COMPARATIVE ANALYSIS

Methods	Advantages	Disadvantages
SVM	SVM's are very good when we have no idea on the data. Works well with even unstructured and semi structured data like text, Images and trees. The kernel trick is real strength of SVM. With an appropriate kernel function, we can solve any complex problem. Unlike in neural networks, SVM is not solved for local optima. It scales relatively well to high dimensional data. SVM models have generalization in practice, the risk of over fitting is less in SVM.	Selecting a "good" kernel operations is not easy. Long training time for large datasets. Hard to understand and interpret the final model, variable weights and individual effect. Since the final model is not so easy to see, we cannot do small calibrations to the model hence its tough to incorporate our business logic. SVM Application Protein Structure Prediction Intrusion Detection Handwriting Recognition Detecting Steganography in digital images Breast Cancer Diagnosis.
ANN	Adapt to unknown situations. Robustness: fault tolerance due to network redundancy. Autonomous learning and generalization	Not exact. Large complexity of the network structure. Forgests.
KNN	Keeps a human in the loop.	Can provide only aggregated or partial

		view for high dimension data.

IV.CONCLUSION

Offline systems work on the scanned image of a signature. In this paper we presented a methodology for Offline recognition of identity signature using the different types algorithm. The system is based on the extraction of the characteristics of the neural network and its ability in distinguishing different patterns. Back-propagation algorithm has been specifically used as it provides the flexibility to use any number of layers. In order to test and evaluate the system, a set of 900 signatures were collected from various sources to train the system. The practical results for accurate speed and inputs showed excellent measurements that are compatible to the benchmark algorithms in the domain. We mainly used the biometric information of the electronic signature for verification, and discarded the graphical signature features (offline signature verification), which may increase the accuracy of signature verification. We will try to make better use of all kinds of signature data and extract effective features to improve the verification accuracy as our future work.

In future work modify the existing algorithm during training and testing model which may improves the performance of the system. In our work, we have proposed an approach for the integration of several biometric methods. We have shown the contribution of this multibiomeric approach compared to the unimodality by increasing the system performances.

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