

Textural and Singular Value Decomposition Feature Extraction Technique for Offline Signature Verification

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Biometrics is one of the most widely used approaches for human identification and authentication. The fact that the signature is widely used as a means of personal identification emphasizes the need for a signature verification system. In this paper, Off-line Signature Verification System using Singular Value Decomposition (SVD), Local Binary Pattern (LBP) and Extended LBP (XLBP) is presented. The signature images are preprocessed by converting the RGB image into gray scale image, resizing, histogram equalization and de-noising. The features are extracted from preprocessed images by SVD, LBP and Extended LBP techniques. The Euclidean distance formula is used for comparing the database samples and test signature samples. It is found that the values of False Acceptance Rate (FAR), False Rejection Rate (FRR) and Equal Error Rate (EER) for optimal threshold correlation are better when compared to that of existing systems.

Keywords : Biometrics, Extended LBP, Local Binary Pattern, Offline Signature Verification, Singular Value Decomposition.

1. INTRODUCTION

A signature is a handwritten depiction of someone's name or nickname that a person writes on documents as a proof of identity and intent. The signature recognition is based on the dynamics of making the signature, rather than a direct comparison of the signature itself. The most obvious and important advantage of signature verification is that fraudster cannot glean any information on how to write the signature by simply looking at one that has been previously written. The signature is an accepted proof of identity of the person in a transaction taken on his or her behalf. Thus, the users are more likely to approve this kind of computerized authentication method. Another advantage of the signature verification as an authentication method is that most of the modern portable computers and personal digital assistants use handwritten inputs, thus

there is no need in invention of principally new devices for biometric information collection.

At the same time there are few signature recognition solutions that can provide sufficiently high recognition rates at a reasonable level of efficiency. This area of research is vastly growing and has a promising future. On-line signature verification is based on dynamic characteristics such as pressure, velocity, acceleration, order of the stroke etc. Off-line signature verification is the art of properly classifying between ones real signature with reasonably good forgeries.

Contribution: In this paper, Offline Signature Verification using LBP, SVD and Extended LBP is proposed. The Discrete Wavelet Transform is used for enhancing the spatial domain features and to reduce noise. The features from the preprocessed signature are extracted using LBP, SVD and Extended LBP. Matching be-

Table 2

Comparison of EERs for GPDS Database

Proposed OSVSLX			OSVPCC [14]	2DGOSV [11]	CGROSV [12]	OSVGTf [13]
LBP	SVD	XLBP				
1.77	4.5	6.94	6.20	13.93	4.21	12.06

tance to analyse these features and arrive at a suitable solution for verifying signatures. The performance of the work can further be improved by fusing the three proposed techniques SVD, LBP and Extended LBP, by making the use of the exact signature space in the pre-processing stage by suitable modifications and by making the use of DT-CWT technique for feature extraction.

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