

Offline Signature Verification Using Minutiae and Curvature Orientation

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Abstract : A signature is a behavioral biometric that is used for authenticating users in most financial and legal transactions. Signatures can be easily forged by skilled forgers. Therefore, it is essential to verify whether a signature is genuine or forged. The aim of any signature verification algorithm is to accommodate the differences between signatures of the same person and increase the ability to discriminate between signatures of different persons. This work presented in this paper proposes an automatic signature verification system to indicate whether a signature is genuine or not. The system comprises four phases: (1) The pre-processing phase in which image scaling, binarization, image rotation, dilation, thinning, and connecting ridge breaks are applied. (2) The feature extraction phase in which global and local features are extracted. The local features are minutiae points, curvature orientation, and curve plateau. The global features are signature area, signature aspect ratio, and Hu moments. (3) The post-processing phase, in which false minutiae are removed. (4) The classification phase in which features are enhanced before feeding it into the classifier. k-nearest neighbors and support vector machines are used. The classifier was trained on a benchmark dataset to compare the performance of the proposed offline signature verification system against the state-of-the-art. The accuracy of the proposed system is 92.3%.

Keywords : signature, ridge breaks, minutiae, orientation

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