Abstract

This paper describes a novel approach to a cancelable template protection scheme that secures online handwritten signature samples in the reference database of a biometric verification system. We propose a renewable-noninvertible transformation process named Bio-Trigono comprising two consecutive steps. First, a shuffling scheme is applied to a signature sample to attain the renewability property for template protection. This is followed by the deployment of a cosine function for which its periodic characteristic is exploited to achieve a much desired non-invertible property for additional security. The overall template protection scheme was tested rigorously on signature samples of a SIGMA database through an online signature verification system. Its verification utilized the Principal Component Analysis (PCA) for features extraction and the Artificial Neural Network (ANN) for user reference.
modeling and classification processes. Results demonstrated an effective cancelable template protection scheme whereby the best averaged error rates were 10.3, 10.5 and 14.1% for un-transformed first and second transformed signature templates, respectively.

References

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**Index Terms**

Computer Science

Artificial Intelligence

**Keywords**

Artificial neural network  authentication biometrics  cancelable biometrics  principal components analysis  security  signature verification  template protection.