A Novel Biometric System based on Hybrid Fusion Speech, Signature and Tongue

Abstract

There is urgent need to make behavioural biometric systems more reliable, robust and accurate. This paper presents feature level fusion of offline signature and speech and tongue biometrics. The fusion of speech and signature with tongue made the system more efficient. MFCC is used for feature extraction in speech and in signature DCT is used which is widely used for image and texture feature extraction. While the features of tongue are extracted using SIFT algorithm. Hybrid weighted average using Apriori two item set is applied for the fusion of extracted features of all the modalities. SVC2004 signature database are used for experimental results. Tongue database was collected by capturing pictures using digital camera while for speech CMU_ARCTIC database which is available at Language Technologies Institute at Carnegie Mellon University is used in the work. Features for both noisy and non-noisy samples have been collected separately. Gaussian noise was added to the system to check the performance in noisy environment. The proposed system also works efficiently on filtered noisy modalities with accuracy of 80%. The accuracy of the noiseless system is 88.75% with 0.06% of FAR and with 0.05% of FRR and the noisy system have FAR 0.05% and FRR 0.15%. The ROC curves are calculated.
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**Index Terms**

Computer Science

Security
Keywords
Biometric   Multimodal Biometric   SIFT   Mel Frequency Cepstral Coefficient
Discrete Cosine Transformation
Apriori Algorithm
Weighted Averaging
Motion Blur filter
False Acceptance Rate
False Rejection Rate
ROC.