Abstract

This paper presents two optimal fusion techniques using reliability and separability measures for a multibiometric system, employing fingerprints and voice. In the first method, reliabilities of fingerprint and voice modalities are measured and the integration weights are computed as the ratio of these two reliabilities. The computed reliability ratio is then optimized against the recognition accuracy. The optimizing parameter is estimated in the training/validation phase. Latter is a multi-normalization based fusion scheme, where the separability measures are used as the integration weights to improve the performance of the biometric system. The inter/intra class separability measures and the d-prime separability measures, under various noise conditions are estimated in the training/validation stage. Performance of the proposed methods are compared with that of the baseline techniques using score level fusion. Experimental studies show that, the proposed methods improve global recognition rate and reduce the False Acceptance Rate (FAR) and False Rejection Rate (FRR) over the baseline systems. The advantage of the proposed biometric techniques is that they can be easily integrated into any multibiometric system with score level fusion and find extremely useful in applications especially with less number of available training samples.
Optimal Score Level Fusion using Modalities Reliability and Separability Measures


Index Terms

Computer Science

Signal Processing

Keywords

Reliability measures Separability measures Score level fusion score normalization noise robustness