

Multimodal biometrics based on identification and verification system

ABSTRACT

The need for an increase of reliability and security in a biometric system is motivated by the fact that there is no single technology that can realize multi-purpose scenarios. Experimental results showed that the recognition rate of Heart Sound Identification (HSI) model is 81.9%, while the rate for Speaker Identification (SI) model is 99.3% from 20 clients and 70 impostors. Heart Sound-Verification (HSV) provides an average Equal Error Rate (EER) of 13.8%, while the average EER for the Speaker Verification model (SV) is 2.1%. Electrocardiogram Identification (ECGI), on the other hand, provides an accuracy of 98.5% and ECG Verification (ECGV) EER of 4.5%. In order to reach a higher security level, an alternative multimodal and a fusion technique were implemented into the system. Through the performance analysis of the three biometric system and their combination using two multimodal biometric score level fusion, this paper found the optimal combination of those systems. The best performance of the work is based on simple-sum score fusion, with a piecewise-linear normalization technique which provides an EER of 0.7%.