ABSTRACT

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Title: DEEP LEARNING FOR SERIAL FUSION BASED USER
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Biometric security systems are taking over the role of traditional verification and authentication methods. To increase the security and performance of biometric systems, the fusion of multiple biometric modalities was introduced. Usually the fusion of multi-modal biometrics is performed with parallel fusion, meaning each biometric modality must be submitted by a user before a verification decision is made. However, multi-modal parallel fusion has demonstrated drawbacks, such as increased verification time and decreased user convenience. To combat these drawbacks, serial fusion was introduced, which sequentially takes the user's biometric modalities and fuses them only if more information is required for a verification decision. Multi-modal serial fusion has been thoroughly investigated using traditional machine learning techniques. This research develops a biometric system utilizing deep learning techniques for extract features and implementing serial fusion at the score level. This multi-modal classification has been conducted with palm, facial, and fingerprint biometrics. Scores will be generated from each biometric trait sequentially and also fused sequentially. Since a verification decision is made once the system has sufficient proof of the identity of the user, it is has been shown the security measures of the system perform better than biometrics systems that do not use fusion.