

Fingerprint Presentation Attack Detection by Efficient Voting Method

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Abstract:

Fingerprint recognition systems have advanced significantly in recent years. However, existing biometric systems based on fingerprint authentication remain vulnerable to spoofing attacks. Evaluating the effectiveness of fingerprint recognition systems requires large-scale datasets, but collecting such data is costly, time-intensive, and restricted by privacy laws. This study introduces a deep learning-based approach called the Efficient Voting Method (EVM) for fingerprint recognition and compares its performance with three widely used models: Random Forest, Extreme Gradient Boosting (XGBoost), and CatBoost. The proposed method achieves superior recognition accuracy while maintaining lower computational complexity compared to existing techniques. Experimental evaluations were conducted using the Ada Test and Verification System (ATVSFing), CustomFing and Sokoto Coventry Fingerprint (SOCOFing) datasets achieving accuracy rates of 67.25%, 88.79%, and 90.30% respectively.

Keywords:

Fingerprint PAD, Soft Voting, Binary, Classification, Biometric Recognition.