Preprocessing and Fusion of Multiple Representation of Finger Vein patterns using Conventional and Machine Learning techniques

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Abstract : Application of biometric features to the cryptography for human identification and authentication is widely studied and promising area of the development of high-reliability cryptosystems. Biometric cryptosystems typically are designed for patterns recognition, which allows biometric data acquisition from an individual, extracts feature sets, compares the feature set against the set stored in the vault and gives a result of the comparison. Preprocessing and fusion of biometric data are the most important phases in generating a feature vector for key generation or authentication. Fusion of biometric features is critical for achieving a higher level of security and prevents from possible spoofing attacks. The paper focuses on the tasks of initial processing and fusion of multiple representations of finger vein modality patterns. These tasks are solved by applying conventional image preprocessing methods and machine learning techniques, Convolutional Neural Network (SVM) method for image segmentation and feature extraction. An article presents a method for generating sets of biometric features from a finger vein network using several instances of the same modality. Extracted features sets were fused at the feature level. The proposed method was tested and compared with the performance and accuracy results of other authors.