2014 International Symposium on Biometrics and Security Technologies (ISBAST)
84

Comparison of Effective Hough Transform-Based Fingerprint Alignment Approaches

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Abstract

In this paper, two effective and mostly used Hough Transform (HT) based fingerprint alignment approaches are compared, namely; Local Match Based Alignment (LMBA) and Discretized Rotation Based Alignment (DRBA). The comparison was performed by considering different conditions of minutiae points, which are rotation, translation and the number of minutiae points. In addition, this research reports the advantages of understanding the quality and relationships between the wide varieties of existing HT based fingerprint alignment methods. Minutiae points extracted from fingerprints of FVC2000 database were used on the experiments to compare these approaches. The results revealed that LMBA approach performs better than the DRBA approach on minutiae points set with larger rotation and small number of points. The DRBA approach was found to perform better with minutiae points with large amount of translation, and the computational time was less than that of LMBA approach. However, the memory usage required in DRBA is greater than memory required in LMBA.