A Novel Deep Supervised Contour Fractal Dimension Analysis Model

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Abstract

A novel palmprint recognition system (PRS) using deep supervised learning (DSL) classifier is proposed in this research work. To divulge the novelty, a deep supervised contour fractal dimension analysis model for palmprint recognition (DCFPR) is put forward. That has a novel region-based contour fractal dimension (RCFD) feature extraction approach and a deep supervised Learning (DSL) classifier approach for acquiring the higher recognition and identification accuracy rate. To accomplish the RCFD approach, traced all the edges/contours of 2D palmprint region of interest (2D-PROI) image using Canny edge detection algorithm and then split into several regions. At each region, fractal dimension (FD) and the slope value (S) are computed in an idiosyncratic manner using the box-counting procedure and then accumulate all FDs and Ss of all regions to create a distinctive feature vector. Classify this feature vector using deep supervised learning (DSL) classifier approach to authenticate the genuine person of the taken palmprint at a higher accuracy rate. In this research, the multi-spectral 2D-PROI image database derived from PolyU, Hong Kong Polytechnic University, Hong Kong. The proposed model has been examined and evaluated with various metrics and found with 98% of authentication accuracy.

Keywords

Palmprint recognition system   Deep supervised learning classifier

Region-based contour fractal dimension   Canny's edge detection algorithm

Box-counting   Fractal dimension

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Abstract

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