

ABSTRACT:

This paper presents novel feature extraction and classification methods for online handwritten Chinese character recognition (HCCR). The X-graph and Y-graph transformation is proposed for deriving a feature, which shows useful properties such as invariance to different writing styles. Central to the proposed method is the idea of capturing the geometrical and topological information from the trajectory of the handwritten character using the X-graph and the Y-graph. For feature size reduction, the Haar wavelet transformation was applied on the graphs. For classification, the coefficient of determination (R^2) from the two-dimensional unreplicated linear functional relationship model is proposed as a similarity measure. The proposed methods show strong discrimination power when handling problems related to size, position and slant variation, stroke shape deformation, close resemblance of characters, and non-normalization. The proposed recognition system is applied to a database with 3000 frequently used Chinese characters, yielding a high recognition rate of 97.4% with reduced processing time of 75.31%, 73.05%, 58.27% and 40.69% when compared with recognition systems using the city block distance with deviation (CBDD), the minimum distance (MD), the compound Mahalanobis function (CMF) and the modified quadratic discriminant function (MQDF), respectively. High precision rates were also achieved.