Improving the Recognition of Handwritten Characters using Neural Network through Multiresolution Technique and Euclidean Distance Metric

Abstract

Good recognition accuracy can be achieved through a combination of multiple classifiers rather than a single classifier. The present paper deals with the handwritten English character recognition using multiresolution technique with Discrete Wavelet Transform (DWT) and Euclidean Distance Metric (EDM). Recognition accuracy is improved by learning rule through the Artificial Neural Network (ANN) along with Euclidean distances in case of misclassification. Handwritten characters are classified into 26 pattern classes based on appropriate property i.e. shape. Features of the handwritten character images are extracted by DWT used with appropriate level of multiresolution technique and then each pattern class is characterized by a mean vector. Distances from unknown input pattern vector to all the mean vectors are computed by EDM. Minimum distance determines the class membership of input pattern vector. EDM provides a good recognition accuracy of 90.77%. In case of misclassification, the learning rule through ANN improves the recognition accuracy to 95.38% by comparing the generated recognition scores and then product of recognition scores with Euclidean distances further improves the recognition accuracy to 98.46%. Weight matrix of the misclassified class is computed using the learning rule of ANN, then the misclassified input pattern vector is fused with
the computed weight matrix to generate the recognition score. Maximum score corresponds to the recognized input character.

References


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Index Terms

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Keywords

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