Support Vector Machines and Convolutional Descriptors for Arabic Handwritten Character Recognition

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Abstract

The field of handwriting recognition is still a great challenge and competition between researchers. In this work, we construct a system for recognition of Arabic handwritten characters using support vector machines (SVM). Our system includes the steps: preprocessing, feature extraction, and classification. In the feature extraction phase, we simulate the behavior of convolutional neural networks (CNN) by integrating convolutional descriptors, where we used five filters: Prewitt, Sobel, Laplacian, point and line detection filter followed by a data reduction step using the Zoning method. To evaluate our approach, we created our own database of Arabic handwritten characters containing 1745 images. Also, we used the HACDB database to test our system. The obtained results are very encouraging.

Keywords Support vector machines, Character recognition, Convolution, Filter, Feature extraction.