Recognizing Farsi numbers utilizing deep belief network and limited training samples

ABSTRACT

Recognizing handwritten letters is one of the important issues that have always been a major challenge in the field of computer vision. To have a better performance of letter identifying systems, one of the primary requirements is to select characteristics that explain a good word picture. Another challenge is the choice of an appropriate method for machine learning, which could be able to separate explanatory features of the characters, effectively. On the other hand, when the data set is small, the training process will be very difficult and error rate will increase. In this paper, Deep Belief Network Learning method is applied to identify Persian numbers. In deep learning method, raw data can be used as network's input; in fact deep learning can perform feature extraction and classification of data, at the same time. Every picture's pixels is changed into a horizontal vector and used for the training step of deep belief network. Although, utilized datasets for training and testing of the network are not huge, in the evaluation section, acceptable results obtained.

Keyword: Recognition of handwritten letters; Deep belief network; Deep learning; Restricted Boltzmann machine