LITERATURE SURVEY

A Novel Method for Handwritten Digit Recognition System

Author name: Najoua Rahal, Maroua Tounsi, Tarek M.Hamdani and Adel M.Alimi.

Year of Publishing: 2019.

Description:

Unconstrained handwriting text recognition is a stimulating field in the branch of pattern recognition. This field is still an open search due to the wide variability of human writing. Recent trends show a potential improvement of recognition by adoption a novel representation of extracted features. In the present paper, we propose a novel feature extraction model by learning a Bag of Features Framework for handwritten text recognition based on Deep Sparse Auto-Encoder. The Hidden Markov Models are then used for sequences modeling. For features learned quality evaluation, our proposed system was tested on two handwritten text datasets IFN/ENIT word images benchmark and MNIST handwritten digits. Our method achieves promising recognition on both datasets.

Author name: Malothu Nagu, N.Vijayshankar.

Year of Publishing: 2011

Description:

Character recognition plays an important role in the modern world. It can solve more complex problems and makes humans' job easier. An example is handwritten character recognition. This is a system widely used in the world to recognize zip code or postal code for mail sorting. There are different techniques that can be used to recognize handwritten characters. Two techniques researched in this paper are Pattern Recognition and Artificial Neural Network (ANN). Both techniques are defined and different methods for each technique is also discussed. Bayesian Decision theory, Nearest Neighbor rule, and Linear Classification or Discrimination is types of methods for Pattern Recognition. Shape recognition, Chinese Character and Handwritten Digit recognition uses Neural Network to recognize them. Neural Network is used to train and identify written digits. After training and testing, the accuracy rate reached 99%.This accuracy rate is very high.

Author name: Chao Zhang, Zhiyao Zhou, Lan Lin.

Year of Publishing: 2021

Description:

In order to meet the needs of paperless offices and greatly improve work efficiency, it is necessary to research and implement a handwritten digit recognition system. Handwritten digit recognition plays an important role in large-scale data statistics and the financial business, such as industry annual inspection, population census, tax statements and checks, etc. This paper proposes a new type of handwritten digit recognition system based on convolutional neural network (CNN). In order to improve the recognition performance, the network was trained with a large number of standardized pictures to automatically learn the spatial characteristics of handwritten digits. For model training, according to the loss function, the convolutional neural network continuously updates the network parameters with the data set in MNIST, which contains 60,000 examples. For model test, the system uses the camera to capture the pictures composed of the images generated by the test data set of MNIST and the samples written by different people, then continuously processes the captured graphics and refreshes the output every 0.5 seconds. With the trained deep learning model, we got a recognition accuracy of 97.3% in test process. Good performance in this experiment shows that our system can automatically recognize the handwritten digital content appearing in the target area and output the content label in real time.

Author name: Likforman-Sulem, Laurence-Sigelle, Marc

Year of publishing: 2017

Description:

We investigate in this paper the application of dynamic Bayesian networks (DBNs) to the recognition of handwritten digits. The main idea is to couple two separate HMMs into various architectures. First, a vertical HMM and a horizontal HMM are built observing the evolving streams of image columns and image rows respectively. Then, two coupled architectures are proposed to model interactions between these two streams and to capture the 2D nature of character images. Experiments performed on the MNIST handwritten digit database show that coupled architectures yield better recognition performances than non-coupled ones. Additional experiments conducted on artificially degraded (broken) characters demonstrate that

coupled architectures better cope with such degradation than non coupled ones and than discriminative methods such as SVMs.

Author name: Yan, Liao; Jia, Zhenhong; Yang, Jie; Pang, Shaoning

Year of publishing: 2010

Description:

A new method for handwritten digits recognition based on hidden markov model (HMM) and particle swarm optimization (PSO) is proposed. This method defined 24 strokes with the sense of directional, to make up for the shortage that is sensitive in choice of stating point in traditional methods, but also reduce the ambiguity caused by shakes. Make use of excellent global convergence of PSO; improving the probability of finding the optimum and avoiding local infinitesimal obviously. Experimental results demonstrate that compared with the traditional methods, the proposed method can make most of the recognition rate of handwritten digits improved.

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2. Najoua Rahal1, Maroua Tounsi2, Tarek M. Hamdani3 and Adel M. Alimi4 REGIM-Lab.: REsearch Groups in Intelligent Machines, University of Sfax, National Engineering School of Sfax (ENIS), BP 1173, Sfax, 3038, Tunisia.

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