LITERATURE SURVEY

A Novel Method for Handwritten Digit Recognition System

Author name: Rohini.M1 , Dr.D.Surendran

Year of Publishing: 2019

Description:

Handwritten digit recognition has recently been of very interest among the researchers because of the evolution of various Machine Learning, Deep Learning and Computer Vision algorithms. In this report, We compare the results of some of the most widely used Machine Learning Algorithms like CNN-convolution neural networks and with Deep Learning algorithm like multilayer CNN using Keras with Theano and Tensorflow. MNIST is a dataset which is widely used for handwritten digit recognition. The dataset consist of 60,000 training images and 10,000 test images.The artificial neural neworks can all most mimic the human brain and are a key ingredient in image processing field.For example Convolution Neural networks with back propagation for image processing.The applications where these handwritten digit recognition can be used are Banking sector where it can be used to maintain the security pin numbers, it can be also used for blind peoples by using sound output.

Author name: Savita Ahlawat , Amit Choudhary , Anand Nayyar, Saurabh Singh and Byungun Yoon

Year of publishing: 2020

Description:

Traditional systems of handwriting recognition have relied on handcrafted features and a large amount of prior knowledge. Training an Optical character recognition (OCR) system based on these prerequisites is a challenging task. Research in the handwriting recognition field is focused around deep learning techniques and has achieved breakthrough performance in the last few years. Still, the rapid growth in the amount of handwritten data and the availability of massive processing power demands improvement in recognition accuracy and deserves further investigation. Convolutional neural networks (CNNs) are very effective in perceiving the structure of handwritten characters/words in ways that help in automatic extraction of distinct features and make CNN the most suitable approach for solving handwriting recognition problems. Our aim in the proposed work is to explore the various design options like number of layers, stride size,

receptive field, kernel size, padding and dilution for CNN-based handwritten digit recognition. In addition, we aim to evaluate various SGD optimization algorithms in improving the performance of handwritten digit recognition. A network's recognition accuracy increases by incorporating ensemble architecture. Here, our objective is to achieve comparable accuracy by using a pure CNN architecture without ensemble architecture, as ensemble architectures introduce increased computational cost and high testing complexity. Thus, a CNN architecture is proposed in order to achieve accuracy even better than that of ensemble architectures, along with reduced operational complexity and cost. Moreover, we also present an appropriate combination of learning parameters in designing a CNN that leads us to reach a new absolute record in classifying MNIST handwritten digits. We carried out extensive experiments and achieved a recognition accuracy of 99.87% for a MNIST dataset.

Author name: Li, Yangyang; Wu, Yunhui; Jiao, Lc; Wu, Jianshe

Year of publishing: 2011

Description:

With the development of society, handwritten digits recognition technique has been widely applied to production and daily life. It is a very difficult task to solve these problems in the field of pattern recognition. In this paper, a new method is presented for handwritten digit recognition. The digit samples firstly are processed and features extraction. Based on these features, a novel immune network classification algorithm is designed and implemented to the handwritten digits recognition. The proposed algorithm is developed by Jerne's immune network model for feature selection and KNN method for classification. Its characteristic is the novel network with parallel commutating and learning. The performance of the proposed method is experimented to the handwritten number datasets MNIST and compared with some other recognition algorithms-KNN, ANN and SVM algorithm. The result shows that the novel classification algorithm based on immune network gives promising performance and stable behavior for handwritten digits recognition.

Author name: Ram Prashanth, N.; Siddarth, B.; Ganesh, Anirudh; Naveen Kumar, Vaegae

Year of publishing: 2017

Description:

We come across a large volume of handwritten texts in our daily lives and handwritten character recognition has long been an important area of research in pattern recognition. The complexity of the task varies among different languages and it so happens largely due to the similarity between characters, distinct shapes and number of characters which are all language-specific properties. There have been numerous works on character recognition of English alphabets and with laudable success, but regional languages have not been dealt with very frequently and with similar accuracies. In this paper, we explored the performance of Deep Belief Networks in the classification of Handwritten Tamil vowels, and conclusively compared the results obtained. The proposed method has shown satisfactory recognition accuracy in light of difficulties faced with regional languages such as similarity between characters and minute nuances that differentiate them. We can further extend this to all the Tamil characters.

Author name: Perea, Manuel; Gil-LÃ³pez, Cristina; BelÃ©ndez, Victoria; Carreiras, Manuel

Year of publishing: 2016

Description:

An examination of how the word recognition system is able to process handwritten words is fundamental to formulate a comprehensive model of visual word recognition. Previous research has revealed that the magnitude of lexical effects (e.g., the word-frequency effect) is greater with handwritten words than with printed words. In the present lexical decision experiments, we examined whether the quality of handwritten words moderates the recruitment of top-down feedback, as reflected in word-frequency effects. Results showed a reading cost for difficult-to-read and easy-to-read handwritten words relative to printed words. But the critical finding was that difficult-to-read handwritten words, but not easy-to-read handwritten words, showed a greater word-frequency effect than printed words. Therefore, the inherent physical variability of handwritten words does not necessarily boost the magnitude of lexical effects.

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