

LITERATURE SURVEY

A Novel Method for Handwritten Digit Recognition System

Author name: Lee, Sukhan; Choi, Yeongwoo

Year of Publishing: 1992

Description:

An approach to robust recognition of handwritten numerals using two operating parallel networks is presented. The first network uses inputs in Cartesian coordinates, and the second network uses the same inputs transformed into polar coordinates. How the proposed approach realizes the robustness to local and global variations of input numerals by handling inputs both in Cartesian coordinates and in its transformed Polar coordinates is described. The required network structures and its learning scheme are discussed. Experimental results show that by tracking only a small number of distinctive features for each teaching numeral in each coordinate, the proposed system can provide robust recognition of handwritten numerals.

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: Gader, Paul; Mohamed, Magdi; Chiang, Jung-Hsien

Year of publishing: 1992

Description:

Experiments involving handwritten word recognition on words taken from images of handwritten address blocks from the United States Postal Service mailstream are described. The word recognition algorithm relies on the use of neural networks at the character level. The neural networks are trained using crisp and fuzzy desired outputs. The fuzzy outputs were defined using a fuzzy k-nearest neighbor algorithm. The crisp networks slightly outperformed the fuzzy networks at the character level but the fuzzy networks outperformed the crisp networks at the word level.

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.

Author name: Hakan; Yanikoglu

Year of publishing: 2017

Description:

We describe a system for recognizing online, handwritten mathematical expressions. The system is designed with a user-interface for writing scientific articles, supporting the recognition of basic mathematical expressions as well as integrals, summations, matrices etc. A feed-forward neural network recognizes symbols which are assumed to be single-stroke

and a recursive algorithm parses the expression by combining neural network output and the structure of the expression. Preliminary results show that writer-dependent recognition rates are very high (99.8%) while writer-independent symbol recognition rates are lower (75%). The interface associated with the proposed system integrates the built-in recognition capabilities of the Microsoft's Tablet PC API for recognizing textual input and supports conversion of hand-drawn figures into PNG format. This enables the user to enter text, mathematics and draw figures in a single interface. After recognition, all output is combined into one LATEX code and compiled into a PDF file.

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