Handwritten Character Recognition using Neural Networks

Abstract

The main aim of this project is to design expert system for , “HCR(English) using Neural Network”. that can effectively recognize a particular character of type format using the Artificial Neural Network approach. Neural computing Is comparatively new field, and design components are therefore less well specified than those of other architectures. Neural computers implement data parallelism. Neural computer are operated in way which is completely different from the operation of normal computers. Neural computer are trained (not Programmed) so that given a certain starting state (data input); they either classify the input data into one of the number of classes or cause the original data to evolve in such a way that a certain desirable property is optimized.

Two phase processes are involved in the overall processing of our proposed scheme:the Pre-processingandNeural network based Recognizing tasks.The pre-processing steps handle the manipulations necessary for the preparation of the characters for feeding as input to the neural network system. First, the required character or part of characters needs to be extracted from the pictorial representation. The splitting of alphabets into 25segment grids, scaling the segments so split to a standard size and thinning the resultant character segments to obtain skeletal patterns.The following pre-processing steps may also be required to furnish the recognition process:

I. The alphabet scan be thinned and their skeletons obtained using well-known image processing techniques, before extracting their binary forms.

II. The scanned documents can be “cleaned” and “smoothed” with the help of image processing techniques for better performance.

Literature Survey

Handwritten character recognition is process of converting the hand written work over page to a attractive digital format.HCR is a intelligent work done throw scanning the images will complete the analysis of character with output. CR require proper handling of complexity of written content, writing environment, materials, etc. HCR techniques are based on extracting various features of handwritten. Isha Vats,Shamandeep Singh[1] In this paper, system was based on recognition of offline handwriting numerals. The main aim of the proposed work in this paper was to efficiently recognize the offline handwritten digits with a higher accuracy. But a difficult problem in this field was the recognition of completely touching handwritten digits and in this paper the proposed system focused on segmentation for isolating the digits so multiple images can be recognize.

Gunjan Singh, Sushma Lehri [2] Handwritten characters was a difficult task because characters are written in various ways, so they could be of different sizes, orientation, thickness and dimension. An offline HCR(Hindi) system using neural network is presented in this paper. Neural networks were good at recognizing handwritten characters as these networks are insensitive to the missing data.A Backpropagation neural network is used for classification. Experimental result of this system shows that results 93%. S S Sayyad, Abhay Jadhav, Manoj Jadhav, Pradip Bele,Smita Miraje,Avinash Pandhare [3] In this paper A neural network approach is proposed for automatic offline character recognition system. In this paper, work has been performed to recognize Devanagari characters using multilayer perceptron.Various patterns of characters were created in the matrix with the use of binary form and stored in the file.This system used the back propagation neural network for efficient recognition and neuron values were transmitted by feed forward method in the neural network.

Shabana Mehfuz, Member IEEE, 2 Gauri katiyar[4] This paper provides review of existing works in HCR based on soft computing technique during the past decade.

Prof. Swapna Borde, Ms. Vinaya Patil, Ms. Ekta Shah, Ms. Priti Rawat [5] This paper presents a fuzzy approach to recognize characters. Fuzzy sets,fuzzy logic were used as bases for representation of fuzzy character and for recognition.Fuzzy-based algorithm which first segments the character and then using fuzzy system gives the characters that match the given input and then using defuzzication system finally recognizes the character. No training is needed by this system for recognition.

Fatos T. Yarman-Vural and Nafiz Arica [6] The rapidly growing computational power enables the implementation of the present Character Recognition methodologies and creates an increasing demand on many emerging application domains, which require more advanced methodologies. The available Character Recognition techniques with their superiorities and weaknesses are reviewed. The Character Recognition is discussed, and directions for future research are suggested. Special attention is given to the off-line HCR since this area requires more research.

Ms. Seema A. Dongare, Ms. Snehal V. Waghchaure, Prof. Dhananjay B. Kshirsagar [7] proposed system deals with development of grid based method which is combination of image centroid zone and zone centroid

zone of individual character or numerical image. Use of feed forward neural network for recognition. Complete process of Devnagiri character recognition works in stages as document preprocessing, segmentation, feature extraction, classification using grid based approach followed by recognition using feed forward NN.