Abstract

recognition. Neural networks are being used for character/pattern recognition since last many years but most of the works are confined to English character recognition. Till date, a very little work has been reported for Handwritten Hindi Character recognition. The main challenge is to maintain high performance level with samples, which are distorted or written in more personal style. Handwritings of every person are different due to the great variations of individual writing styles, different size and orientation angle of the characters. In this paper, conventional feature extraction (Global pixel), Gradient feature extraction and 8-Directional Gradient Feature (8-DGF) Extraction, 16- Directional Gradient Feature Extraction (16-DGF) technique for handwritten Hindi character recognition have been implemented by using two layer fully connected Back propagation Feed-Forward neural network. The mouse has been initialized in graphics mode so that characters could be written directly on the screen. Once the character is written on screen, four input files are created consisting of the Global pixel input values, Gradient input values, 8- Directional Gradient input values and 16- Directional Gradient input values respectively. Character has been taken in 32x32 pixels i.e. 1024 neurons as an
input. At hidden layer 12 hidden units or neurons have been taken. In this way, one hidden layer and one output layer have been taken. The network has been trained by giving the input data of respective network. One thousand samples were taken from 100 people of different age group, 10 samples from each person for training the network (train data) and testing the network (test data). Out of these samples, 500 samples were taken for training the network and 500 samples were taken for testing the network. A comparative analysis has been carried out, and experimental result shows that 8-DGF and 16-DGF extraction are better than conventional feature extraction and Gradient feature extraction in terms of recognition accuracy. The 16-DGF provides 96% recognition accuracy but it requires more training time as compared to 8-DGF extraction technique.

References

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**Index Terms**

Computer Science  
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**Keywords**

Gradient Feature Extraction  
Directional Gradient Feature Extraction  
Recognition  
Accuracy