A FRAMEWORK OF HANDWRITTEN MYANMAR DIGITS AND CHARACTERS RECOGNITION BY USING BACKPROPAGATION NEURAL NETWORK

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ABSTRACT

paper proposes a framework for recognizing the written Myanmar-digits and characters on a . Supervised learning of Multilayer forward Neural Network is used to develop this gnition. Backpropagation algorithm is applied to ll of the recognition of handwritten digits and acters to the network. The Network has to be d with several different forms of handwritten anmar-digits and characters. This proposed work can recognize the Myanmar digits and acters in the Roll-No and payment amount fields the voucher sheet and then calculates the sum of all gnized payment amount values. This system ludes two main subsystems: image preprocessing d training Neural Network with Backpropagation orithm.

ywords: Multilayer Feedforword Neural Network, kpropagation Algorithm, Handwritten

1. INTRODUCTION

e of the most classical applications of the Artificial ural Network is the Character Recognition System. is system becomes the basic for many different types applications in various fields such as, processing a eck, performing an eye/face scan at the airport rance, teaching a robot to pick up an object, etc. day, OCR is widely employed in the post offices, nks, airports, airline offices and businesses. OCR o has been the subject of research activity for many ars.

Handwritten character recognition is more difficult nd heuristic approach since it contributes a very large mber of variations and styles of digit patterns written y different people. There are many different pproaches, methods, and algorithms for OCR systems. Handwritten Character Recognition Systems have been developed for many languages and character sets. Several methods for recognizing Latin, Chinese, Japanese, Thai, Greek characters have been proposed. This paper aims to develop the recognition for handwritten Myanmar digits and characters.

The related works of handwritten digits and characters recognition are pointed out in section 2. The next section, Section 3, explains the nature of multilayer feedforward neural network. In Section 4, the proposed system is explained with step by step approach. In section 5, the experimental results of the proposed system are described with tables and graphs. Finally, section 6 concludes the proposed system.

2. RELATED WORKS

Numerous document recognitions have been proposed in various languages and character set. In [10], off-line cursive Czech text recognition has been presented using histograms and also described the difference for Czech and English handwritten text. In [5], automatic recognition of type written Arabic character sets was described by the use of Zernike Moments as a feature extractor.

Nilar Thein [7] proposed a recognition method for Myanmar Car license plate number, which identified out printed Myanmar character and digits by using Backpropagation Neural Network.

In [6], histogram-based handwritten Myanmar-OCR was presented by using the rule generation of H-rule (Horizontal rule), V-rule (Vertical rule) and HV-rule.

In [4], the use of Hidden Markov Models (HMMs) for off-line Myanmar handwriting word recognition was discussed.

3. BACKPROPAGATION NEURAL NETWORK

The multi-layer feedforward neural network is used in this system to classify handwritten Myanmar-digits and characters. The network has three layers: input, output, and one hidden layer. The supervised learning Backpropagation Algorithm is used. The two important phases in Backpropagation Algorithm are training and testing. During the training the errors at the output layer are backward propagated through the hidden layers. The weight of each connection is adjusted for all the connections. The process is repeated for either a predefined number of iterations or until the learning starts saturate. Learning starts by using a predefined training set and the desired output is represented. The Backpropagation Learning Algorithm is based on an error-correction learning rule. The algorithm calculates the difference between the actual response and the desired output of each neuron.

Feed-forward NNs allow signals to travel one way only; from input to output. There is no feedback (loops). Feed-forward NNs tend to be straight forward networks that associate inputs with outputs. They are extensively used in pattern recognition.