Multi-threaded Multilayer Neural Network for Character Recognition

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Abstract. New techniques are evolving day by day to recognize characters in any image, text, cards, etc. Optical character recognition is a well-accepted technique to recognize characters in scene or optically captured image. In this present work, we have evolved new method which employs feed forward back propagation (FFPB) technique interlaced with multi-threaded multilayer perceptron neural network (MTMLNN) to recognize the characters with speedup in operations and better accuracy in character recognition. In present methodology, we have employed structured similarity index measure (SSIM) in MTMLNN to compare image and sigmoid function for neuron activation with stochastic gradient descent method for optimization, to train the neural network to recognize the input character with better accuracy.

Keywords: Feed forward back propagation (FFBP) · Multi-threaded multilayer perceptron neural network (MTMLNN) · Optical character recognition (OCR) · Structured similarity index measure (SSIM)

1 Introduction

In computer vision, character and object recognition plays vital role. Importance of character extraction and recognition from the images has been receiving more attention in recent years [1–4]. Various techniques and methods have been working in this area to recognize characters or objects efficiently with précised accuracy. Character recognition is generally done by optical character recognition (OCR), which means it uses optical medium to read the characters. In general, image is captured through the camera device and applied image processing methods to recognize correct pattern in an image. Several applications are working on OCR. Several techniques have evolved to recognize the character with better accuracy such as template matching (TM), support vector machine (SVM), and neural network (NN). One of the novel approaches to recognize the characters is NN.