

**HANDWRITTEN CHARACTER  
RECOGNITION USING CUSTOMIZED,  
SEQUENTIAL CONVOLUTIONAL  
NEURAL NETWORK**



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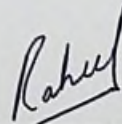
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## Abstract

Handwritten character recognition is a field that falls under the domain of image recognition. It has been under research for years. The main purpose of handwritten character recognition is to recognize characters written by humans in a paper that is available in digital form. This research work is focused on recognition English characters including uppercase, lowercase and the digits using a convolutional neural network.

In this research work, a customized convolutional neural network model is proposed called E-Character Recognizer after several experiments on different parameter values of the convolutional neural network. The English character dataset, EMNIST is used to test the performance of E-Character Recognizer which is compared with the different pre-trained models including VGG-16, VGG-19, DenseNet-121, ResNet50 V2 and Mobile Net V2 on the same dataset. The problem encountered in the model was confusion due to the similarity of the structures of some of the characters like “l” and “1” etc. it has proved to be the main reason for confusion for the model.

Upon the comparison, the accuracy of the E-Character recognizer is the best as compared to the pre-trained models. E-Character recognizer has produced better results in terms of both the accuracy and the training time. The E-Character recognizer has performed better as compared to the pre-trained model with an accuracy of 87.31%. The research was conducted on the Google Colab GPU service.

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