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## Handwritten Digit Classification using Python

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Abstract: Handwritten digit recognition is the intelligence of computers to recognize digits written by humans. But it becomes one of the most challenging tasks for machines as handwritten digits are not perfect and can be made with many different: flavours, size, and thickness. Thus, as a solution to this problem, Handwriting digit recognition model comes into picture. Many machine learning techniques have been employed to solve the handwritten digit recognition problem. This paper focuses on Neural Network (NN) approaches. Among the three famous NN approaches: deep neural network (DNN), deep belief network (DBN) and convolutional neural network (CNN), the specialization of CNN as compared to other NN of being able to detect pattern is what makes it so useful for recognizing handwritten digits in this paper. Our goal is to implement a CNN based handwritten digit recognition model that uses the image of a digit and recognizes the digit present in the image. The performance is tested on MNIST dataset. The network was trained on 60,000 and tested on 10,000 numeral samples. We carried out extensive experiments and achieved a recognition accuracy of 99.87%.

Keywords: Handwritten digit recognition, Machine learning, Deep Learning, Convolutional neural network, digit recognition, classification





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