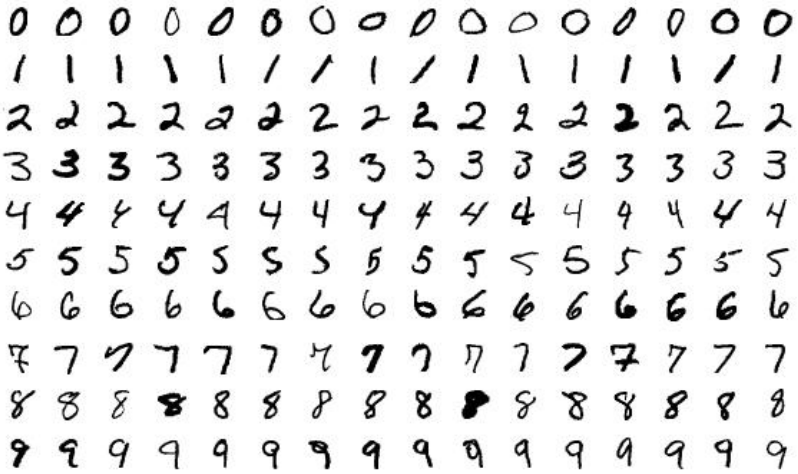
The MNIST database of handwritten digits is a dataset of 60,000 training examples and 10,000 testing examples. Each example is a 28×28 grayscale image of a handwritten digit, between 0 and 9.

The MNIST dataset is a classic example of a machine learning benchmark, and it has been used to develop a wide variety of machine learning algorithms.



Source: https://en.wikipedia.org/wiki/MNIST_database

The MNIST database is a public dataset and can be downloaded from a variety of sources. The most common format for the MNIST dataset is the HDF5 format, which can be read by a variety of machine learning libraries. The MNIST dataset is relatively small, and it can be trained on a standard laptop computer.

Machine learning algorithms struggle with the MNIST dataset. Algorithms find it difficult to recognize hand-drawn digits due to the variation in human handwriting. Despite this, several machine learning algorithms have been developed using MNIST dataset which perform excellently.

Convolutional Neural Network (CNN) is one of the most common forms of machine learning algorithm used in training over the MNIST dataset. They are type of artificial neural networks that are mainly applied for image recognition tasks. It has been noted that CNNs have achieved state-of-the-art performance on the MNIST dataset with error rates below 1 percent.

Other algorithms which have been used to train on MNIST include Random Forests, and K-nearest neighbors (KNN), and Support Vector Machines (SVM). On this note, they are also known for their high accuracies in dealing with the MNIST database.

The MNIST dataset is an important resource for researchers and implementers in machine learning. It is a good dataset having a large number of instances and it has helped develop many different kinds of machine learning algorithms. In addition, The choice of MNIST as a benchmarking task for evaluating ILA performance on images allows comparison among other computer vision tasks.

References:

- Convolutional Neural Networks by Jürgen Schmidhuber
- Hands-On Machine Learning with Scikit-Learn, Keras, and TensorFlow by Aurélien Géron
- Deep Learning for Computer Vision with Python by Rajalingappaa Shanmugamani

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