MNIST Digit Classification using Parallelised Convolutional Neural Network

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N. Aravindhraj ; V. Vilasini ; S Kiruthik Vishaal ; R Jaiprakash ; R Cibi Siddaarth **All Authors**

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Abstract:
A program or piece of computer software is often built using serial computing techniques. In simple terms, a problem's solution is created by breaking it down into smaller instructions, which are then each individually carried out by a computer's Central Processing Unit (CPU). These modular instructions are first queued and then carried out one by one. Due to the fact that only one instruction was being performed at a time, this was a problem that could be plausibly argued to need to be solved in the computing industry. Hence, parallel computing is employed to benefit from serial computing. Using many processing elements simultaneously to solve a problem or carry out an instruction is known as parallel computing. Every operation is run or processed simultaneously, and problems are divided up into discrete instructions and solved that way. The number of Central Processing Units (CPU) in large-scale supercomputers is continually increasing, and parallelism is a key component of all modern supercomputer architectures. A deep learning technique called the Convolutional Neural Network (CNN) learns directly from the data. When dense layers are added, it transforms into a sizable polynomial time approximation technique. The Convolutional Neural Network (CNN) method will run faster and be greatly improved when it is parallelized. This strategy can be built on top of several convolution neural network -using applications. One such application that uses the convolution neural network technique to find numbers in images is MNIST classification.

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