Development of a High Efficiency Pattern Recognition Algorithm Using Neural Networks

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The purpose of my project was to create an artificial intelligence algorithm that would, be able to identify hand-written digits without using any existing artificial intelligence libraries. I started by creating a single layer neural network that involved having inputs connected to outputs by weighting factors. I created my computer programs without using existing libraries. I randomly generated data with different patterns that my algorithm would, over time, learn to identify. I used a series of equations to train my algorithm on. After I successfully created my single layer neural network I created a hidden layer neural network. This is similar to the single layer network except that the inputs are connected by weights to a hidden layer and then the hidden layer is connected by weights to the outputs. This network works similarly but with one extra step which was the hidden layer. I tested different training data sizes and came to the conclusion that the more training data, the better. Then I used my hidden layer network and edited it to be able to identify hand-written digits. I downloaded all of my characters for my program from an open-source national database and was successful in my goal of creating a neural network that would be able to read hand-written digits. My algorithm read the digits correctly at 95 percent. I was very pleased with this result because I originally hoped that it would be at a 50 percent accuracy.

Awards Won: