

Multi-class Classification using Neural Networks

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1 Introduction

In this assignment, I implemented a multi-class neural network with one hidden layer to classify the digits dataset. The neural network was trained using the softmax activation function and the ReLU activation function for the hidden layer. The network was trained using the cross-entropy loss function and the stochastic gradient descent optimization algorithm.

2 Initial vs. Final Accuracy

The accuracy of the neural network was fairly high even initially, at around 90% with 60 hidden units and 50 epochs. After adjusting the hidden layer size to 256 and increasing the number of epochs to 1000, the accuracy jumped to 93.89%.

3 Potential Improvements to Boost Accuracy

In order to further improve the accuracy, I could try different loss functions (e.g., hinge loss) to see if they yield a higher accuracy. I could also try increasing the number of hidden units or adding more hidden layers to the network.