

Summary:

1. You used two hidden layers. Try using one or three hidden layers and see how doing so affects validation and test accuracy.

When only one hidden layer is used, validation accuracy begins to decline after the fourth epoch while training accuracy continues to rise. The training loss clearly shows a decreasing trend in the graph, whereas the validation loss initially decreased but increased after the fifth epoch, indicating overfitting. When using three hidden layers, accuracy increased for two epochs and then began to fluctuate. Adding more layers resulted in less accuracy.

2. Try using layers with more hidden units or fewer hidden units: 32 units, 64 units, and so on

Training loss is studied less during the training phase, whereas validation loss is studied more from the third epoch. Validation accuracy increased after the third epoch and gradually decreased after that. Increasing the number of nodes in the network resulted in a decrease in accuracy.

3. Try using the mse loss function instead of binary\_crossentropy

When MSE is used instead of binary\_crossentropy, accuracy is more stable. Training and validation loss showed a similar trend until two epochs when there was a significant difference. Validation accuracy began to decline after the fourth epoch when MSE was used as the loss function.

4. Try using the tanh activation (an activation that was popular in the early days of neural networks) instead of relu

While training accuracy increased, validation accuracy increased until the second epoch and then declined. Validation loss increased more when ReLu was used than Tanh, and validation accuracy fluctuated more in ReLu than Tanh.

5. Use any technique we studied in class, and these include regularization, dropout, etc., to get your model to perform better on validation

Training accuracy steadily increased, whereas validation accuracy increased until 8 epochs and then nearly decreased. Using the dropout technique, accuracy improved over many epochs, and the graph showed no significant change in validation accuracy.