

Neural Net and Delta-Deltas

I (Todd) spent a bunch of time trying to do this with a neural net so I thought I would describe my process to you so you could see my work. In the end, a random forest had better performance. I think this might be a quirk of scikit-learn's MLP implementation. I honestly found it a little lacking in terms of analysis and customization.

So, first I used a Nearest Neighbors classifier to get a nice baseline. This performed pretty poorly, so I got a new baseline with a decision tree. I could get ~0.5 accuracy.

After that, I naively trained a few neural nets on the data with a few different hyperparameters. I got slightly better performance than the baseline but not by much. I calculated the delta-deltas but they actually decreased performance, I'd imagine because we didn't have enough data for the number of features we had.

So, I got more serious. I normalized the data such that every feature in the training set had mean 0 and standard deviation 1. This transformation is applied to all future predictions using scikit learn's scaler. Then I picked different sets of hyperparameters and did a brute force evaluation, with 108 different combinations in all. I printed out a list of tuples of these results and piped that to a file. That tuple is below:

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I don't actually expect you to glean anything from this. I just wanted to show the analysis I did. The important figure is none of them are even as high as **0.6**. After this, I essentially ruled out neural nets for this assignment.