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Final Project Proposal

For this final project, we will build a neural network to solve the task of letter recognition; specifically, we will be building a convolutional neural network (specifics of the architecture will be determined later). We will compile a database of different letters handwritten by a variety of people. In doing so, we hope to capture a wide variety of different handwriting styles, which will help generalize our neural network for a broad range of applicability. To achieve this, we will ask different individuals to write the alphabet a few times on a sheet of paper and normalize the data afterwards, repeating this process for a sample size of at least 10 people. We will perform cross-validation to build our final model.

In addition, we will also be conducting two computational experiments on our network. One computational experiment that we will perform is testing different regularization methods. Specifically, we will be testing the effectiveness of dropout, early stopping, and data augmentation. To augment our data, we will also take digital text sampled from different font families, and mix it in with the regular data, as a way to better generalize the neural network. Another computational experiment we will be performing is tweaking the architecture of the network. We will be adjusting the number of convolutional layers & their respective sizes, using different pooling strategies (max vs. avg pooling), and adding less/more linear layers.

For our final product, we hope to build a neural network that can robustly identify handwritten letters from a variety of people. This type of network can have a huge applicability in fields such as computer vision, postal domain, handwritten doctor's notes, etc. Thus, we believe that this is a good neural network to build for our final project.