MAIS 202 ASSIGNMENT 4

Modified-MNIST Challenge

Team: Stack Exchange Campers

Write-up:

For this problem, we chose to implement a Convoluted Neural Network using Keras. We chose to use a Sequential model for easier implementation and quick testing. Towards the end of the competition, we tried implement Transfer Learning and tried to use VGG16, but as it turned out, it took way too much time to train, and we ended dropping it.

As for our results our first attempt was using only slight data preprocessing by thresholding and denoising each image. We ended up getting around 88% accuracy. However, for our 2nd attempt, we used data augmentation on our data, adding random shear, rotation, resizing and zoom on the data, and we ended up getting 94% accuracy. I am convinced we could have squeezed a percent or two of accuracy from our model by training it for a few more epochs, but unfortunately, we ran out of time.

As for our challenges. First, it was kind of hard to coordinate working with people internationally. 2nd I think handling errors on Colab and Kaggle, we kept running out RAM when preprocessing our data, and as such it kept crashing our runtime, and it wasted us many hours. We had to do hacky stuff like saving our preprocessed data and restarting the runtime multiple times to train the model a single time. Data preprocessing/Using OpenCV had a slight learning curve.

In conclusion, this assignment was very educational, and I think was a good synthesis of this amazing course. We learnt a lot in almost every aspect, especially more about tackling a problem from scratch, and implementing a solution, which contrasted with the other assignments which held your hands a bit more. Plus, formatting it like a competition made it more exciting and fun.

Team Contribution:

- **Elodie:** Research on data augmentation
- **Jackson:** Research on Transfer Learning
- **Xin Rui:** Data preprocessing/augmentation, Model implementation, Predictions, Write-up