

Assignment 1, Implementation of MLP

Requirements

Please provide a implementation of api for MLP model training and inference. Implementation needs to consider the following requirements:

- 1, Don't use ai programming frameworks such as PyTorch, Tensorflow and etc.
- 2, Flexible definition of MLP structure.
- 3, Multiple activation options
- 4, Classification and regression
- 5, Weight initialization options
- 6, SGD optimizers: Momentum, RmsProp, Adam
- 7,SGD stop criteria
- 8,Regularization l1, l2, elastic
- 9,Confusion matrix
- 10, Optional parallel SGD
- 11, API design/specification
- 12, Optional Web api.
- 13, Loss tracking
- 14, Other helper classes

It is highly recommended using different programming languages other than python, and design your own api specification that will satisfy complete deep-learning programming, and also try parallel of training using multi-threads or gpus if available.

Notice

- 1, Gen code is acceptable but requires to satisfy above.
- 2, You need to demonstrate you understand and capable of this implementation.
- 3, Therefore, must run and provide detailed results, such as the model (save in file), confusion matrix and other evaluations.
- 4, Reports on key points of your design and implementation.
- 5, Recommended datasets include:
 - Mnist dataset for classification: <https://www.kaggle.com/datasets/oddrational/mnist-in-csv>
 - Boston house dataset for regression.