

Experiments on Cost Functions

MNIST Classification

Scope of this project:

The scope of this problem statement pertains to using different cost functions to assess the performance of MNIST classification

Objectives of this project

- Learn the pros and cons of different cost functions on MNIST classification task

Problem Statement:

1. Download MNIST dataset if needed.
2. Run the MNIST MLP code from Keras examples and obtain the baseline accuracy for training and validation. Let us call this “baseline accuracy”. Make sure that you use 2 hidden layers and ReLU activation.
3. Now, replace the activation function with $\text{Cos}(x)$ instead of ReLU. You can use Keras lambda function or other techniques to introduce this activation. You can also develop a custom Keras layer that supports $\text{Cos}(x)$
4. Measure the accuracies and compare them with the baseline values
5. Report your results that address several questions that include: How long does the training loss take to converge? Is it comparable to ReLU? How do the accuracies compare?
6. Repeat the above for the ELU cost function (Exponential Linear Unit)
7. Report all the results and send your reports by 20th Nov 2018, 10 pm IST