

Introduction to Machine Learning (EL-GY 9123) – Spring 18

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Team Members

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Project Title

Spiral Data Classifier



Project Abstract

The objective is to evaluate the validation accuracy in classification of spiral data. A synthetic dataset of spiral values will be used and various SVM kernels and pre-trained Neural Networks can be compared in classifying a binary or multi-class spiral dataset. An extension of this project can be to explore if using FPGA could provide a hardware advantage in classification, by making use of multiple concurrent matrix-multiplier units, as proposed in [5], although Google's implementation makes use of ASICs.

Milestones

- Build a synthetic data set of spiral values
 - Initially only binary classification would be considered. Later, it can be extended to multi-class.
 - Alternatively, can use the Kaggle dataset given in [2]. It has 3 output classes.
- Perform Data Training and Testing on:
 - SVM Kernel – RBF
 - SVM Kernel – Linear
 - Neural Network
 - (Open to considering other options of SVM Kernels and Neural Networks that may potentially provide better accuracy)
- Compare the Validation Accuracy and find which classifier is better

References

1. Understanding Neural Networks with Tensorflow Playground - [Google Cloud Blog Link](#)
2. Spiral Data set - [Kaggle Link](#)
3. Tensorflow Playground Spiral Data Simulation on Neural Network - [Tensorflow Playground Link](#)
4. Tensorflow Playground Github - [Github Link](#)
5. An in-depth look at Google's first Tensor Processing Unit (TPU) - [Google Cloud Blog Link](#)