Design and Acceleration of Machine-Learning back-ends on modern Architectures
Background and Goals

MagmaDNN

- Neural network framework implemented with MAGMA.

Goals

- Implement various neural networks using common tools (Keras).
- Discover performance bottlenecks.
- Implement a chosen network in MagmaDNN and compare the results.
Current Work and Findings

Implemented two CNN architectures testing on variety of Image benchmarks.

Lenet-5

VGG-16

Current Work and Findings

Datasets Used:
- MNIST
- Dog/Cats
- CIFAR-10
- ImageNet subset

General Problem:
- Model is overfitting
Current Work and Findings

Causes

● To much noise.
● Not Enough data.
● Size of the image matters.

Potential Solutions

● Data augmentation / pre processing
● Regularization
● Tune hyperparameters
Future Work

Implement a Network that performs well on ImageNet subset benchmark.

Implement the same network within MagmaDNN.

Compare results in terms of accuracy/ loss and time to train.

Looking into parameter tuning applications such as OpenTuner.