COLLEGE of ENGINEERING AND PHYSICAL SCIENCES

SCHOOL OF COMPUTER SCIENCE

MSc Defence

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Protim Roy

MINI-BATCH ALOPEX-B FOR TRAINING NEURAL NETWORKS

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Abstract:

While gradient descent is the dominant approach to parameter adaption in neural networks, ALOPEX-B is an alternative to gradient-based methods. In this thesis, we present a version of ALOPEX-B that calculates the global loss of a neural network twice to make these weight perturbations.

The results of the training procedure are shown in the XOR problem by plotting the functions calculated by each neuron of the 2-2-1 neural network. These functions are then compared to a network trained with gradient descent and Adam. The same algorithm is then used to train a logistic regressor in order to learn MNIST. Here we apply a mini-batch procedure and show that ALOPEX-B is able to have a lower loss in fewer epochs than stochastic gradient descent. We also provide a hybrid version of ALOPEX-B which calculates a gradient in order to set the direction of descent.