On Least Squares Auto-Tuning for Image Classification using the Kuzushiji-MNIST Dataset: Numerical Experiment

Hsin-Yu Chen and Kan-Lin Hsiung

Department of Electrical Engineering,
Yuan-Ze University, 135 Yuan-Tung Road, Chung-Li, Taiwan 32003

Abstract

Recently, a novel method, called the "least squares auto-tuning", which can find hyper-parameters in LS problems (that minimize another (true) objective), is proposed [1]. Although nonconvex and cannot be efficiently solved, this problem can be approximately solved using a powerful proximal gradient method to find good hyper-parameters (for LS problems).

In this short paper, to evaluate the effectiveness of the LS auto-tuning method, we realize numerical experiment on a classification problem using the Kuzushiji-MNIST dataset [2].
.
Keywords: Least squares; hyper-parameter optimization; Kuzushiji-MNIST

REFERENCES

[1] Least Squares Auto-Tuning, S. Barratt and S. Boyd, Engineering Optimization 53(5):789–810, May 2021.

[2] https://github.com/rois-codh/kmnist