Qinqing Zheng

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Overview

I work in the intersection of machine learning, optimization and statistics. My current research interests are applied machine learning methods.

Prior to Penn, I was a research scientist in Facebook from 2017 to 2019. With my teammates, I help Facebook build its distributed training system for training deep personalization and recommendation models. My work concentrates on distributed optimization algorithms and system architecture design.

During PhD, my research centers around computationally efficient methods with theoretical guarantees for challenging machine learning problems, with an emphasis on finding exact solutions for nonconvex problems.

Education

2012-2017 **Ph.D. in Computer Science - The University of Chicago**

Advisor: Prof. John Lafferty
Thesis: First Order Methods for Nonconvex Optimization via Symmetric Factorization

2009-2012 **M.S. in Computer Science - Max Planck Institute for Informatics**

2005-2009 **B.Eng. in Digital Media - Zhejiang University**

Fall 2007 **Visiting Student, Ecole Superieure d'Ingenieurs en Genie Electrique**

Employment

Sep 2019 - Present **University of Pennsylvania, Department of Statistics - Postdoc Researcher**

- differential private models and algorithms
- personalized federating learning
- perspective sentence embedding for NLP

Oct 2017 - Sep 2019 **Facebook - Research Scientist**

I worked on building the distributed training platform for deep learning in Facebook. My work was focusing on

- Scalable distributed optimization algorithms for model parallelism or data parallelism. Different directions are being explored, including decentralized and asynchronous algorithms.
- Flexible computing framework that can easily express complex, hierarchical optimization algorithms.

June 2016 - Sep 2016 **Facebook - Software Engineering Intern**

I worked in the field of feed content understanding.

- Developed classifiers to predict the topics of user posts, using multi-modal data.
- Developed interpretable methods based on gradient boosted decision tree.

May 2012 - Aug 2012 **Ebay - Data Analysis Intern**

- Large scale feature selection for click rate prediction.

Publications

1. **Sharp Composition Bounds for Gaussian Differential Privacy via Edgeworth Expansion**
   Qinqing Zheng, Jinshuo Dong, Qi Long, Weijie J Su ICML 2020
2. **Near-Optimal Confidence Sequences for Bounded Random Variables**
   Arun Kumar Kuchibhotla, Qinqing Zheng arXiv:2006.05022 (submitted)
3. **ShadowSync: Performing Synchronization in the Background for Highly Scalable Distributed Training**
   Qinqing Zheng, Bor-Yiing Su, Jiyan Yang, Alisson Azzolini, Qiang Wu, Ou Jin, Shri Karandikar, Hagay Lupesko, Liang Xiong, Eric Zhou arXiv:2003.03477 (submitted)
4. **First Order Methods for Nonconvex Optimization via Symmetric Factorization.**
   Qinqing Zheng, Ph.D. Thesis, The University of Chicago, 2017.
5. **Convergence Analysis for Rectangular Matrix Completion Using Burer-Monteiro Factorization and Gradient Descent**
   Qinqing Zheng and John Lafferty. arXiv:1605.07051.
6. **A Convergent Gradient Descent Algorithm for Rank Minimization and Semidefinite Programming from Random Linear Measurements**
   Qinqing Zheng and John Lafferty. NIPS 2015.
7. **Interpolating Convex and Non-Convex Tensor Decompositions via the Subspace Norm.**
   Qinqing Zheng and Ryota Tomioka. NIPS 2015.

Mentorship

Intern Manager

- T. Yu, Software Engineer Intern, Facebook, Aug 2018 - Nov 2018
  - Multi-GPU Batch Normalization for Real-Time Object Detection
  - Blockwise Model Update and Filtering (BMUF) in Distributed Ads Model Training

Skills

Language: C, C++, CUDA, Java, Python, SQL, Spark, R, Matlab
Framework: Pytorch, Caffe2, Tensorflow

Last updated: July 17, 2020