Uthaipon (Tao) Tantipongpipat

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Summary

Graduating PhD student in machine learning theory and optimization. Strong background in mathematics and algorithmic foundations of data science with hands-on implementations on real-world datasets. Strive for impact and efficiency while attentive to details. Enjoy public speaking and experienced in leading research projects.

Selected Projects

Research Intern
Microsoft Research, Redmond, WA 2019

- Implemented privacy guarantee on large-scale Natural Language Processing models (RNNs and LSTMs) to protect against personal deidentification due to model usage
- Developed novel correlation clustering algorithm with corresponding privacy analysis
- Researched private submodular optimization and surveyed literature for private stochastic gradient descent best for training deep learning models

Differentially Private Synthetic Data Generation
Georgia Institute of Technology, GA 2018-2019
Code publicly available at https://github.com/DPautoGAN, in Python and Pytorch for neural networks.

- Improved privacy protection by 100x compared to a previous work by autoencoder and GAN architecture and new noise injection mechanism
- Developed new statistical and visual evaluation metrics for better understanding of synthetic data

Multi-Criteria Optimization for Fair Dimensionality Reduction
Georgia Institute of Technology, GA 2018-2019
Code publicly available at https://github.com/sdpforall/. In MATLAB and CVXOPT on Python.
Website: https://sites.google.com/site/ssamadi/fair-pca-homepage. Also appears at Georgia Tech news: https://www.scs.gatech.edu/news/628783/making-sure-computing-machines-dont-stereotype-people

- Initiated the study of bias in machine learning during dimensionality reduction preprocessing and identified such bias of commonly used algorithms in real-world datasets
- Developed new heuristics to minimize bias in dimensionality reduction that runs 10x-1000x faster than standard semi-definite programming solver
- Provided thought leadership in the mathematical structure of the optimization program solutions

Skills

Technical: Python, Pytorch, Pandas, CVXOPT, Java, C++, MATLAB, Mathematica, LaTeX, MS Word, MS Excel, MS PowerPoint

Communication: Public speaking – Toastmaster

Languages: Thai (native); English (fluent)

Awards and Fellowships

Academic:

Best reviewers (top 10%) of NeurIPS (top-tier machine learning conference) 2019
Robins Science Scholar, University of Richmond (merit scholarship covering full tuition, fees, accommodations, and meals for four years) 2012-2016
Phi Beta Kappa (most prestigious honor society for liberal arts and sciences) 2016

Programming Competitions:

1st Prize and People's Choice Awards ($20,000 total), Privacy Engineering Challenge, National Institute of Standards and Technology (NIST) 2018
Finalist, ITA Tech Challenge programming competition, Illinois Technology Association, IL 2016
2nd Place, Mid-Atlantic Regional ACM Programming Contest, Christopher Newport University 2015

Mathematics and Economic Competitions:

Honorable Mention (top 2.5%), William Lowell Putnam Mathematical Competition 2015
3-Year Finalist, International Mathematical Olympiad (IMO) selection, Thailand 2010-2012
Honorable Mention, Finance and Economics National Competition, National Bank of Thailand 2011
Bronze Medal and Honorable Mention, Asia-Pacific Mathematics Olympiad (APMO) 2010-2011

Education

Georgia Institute of Technology, Atlanta, GA, United States Expected May 2020
PhD in Algorithms, Combinatorics, and Optimization (ACO), School of Computer Science
Minor in Computational Learning Theory. GPA 4.00/4.00
Thesis proposal topic: Machine Learning under Budget and Fairness Constraints

University of Richmond, Richmond, VA, United States 2012-2016
BS in Mathematics (Honors with thesis)
Minor in Computer Science. GPA: 3.97/4.00

University of Oxford, Oxford, UK 2014-2015
Study Abroad Program in Mathematics and Computer Science

Academic Publications

I have published several publications and delivered oral presentations at top-tier machine learning and theoretical computer science conferences: 3 in NeurIPS, 1 in COLT, and 1 in SODA. For more information, please see my website www.cc.gatech.edu/~uthaipon3/ or my Google Scholar page https://scholar.google.com/citations?user=nzO_5FMAAAAJ&hl.

Academic Service

Reviewer of NeurIPS (conference on Neural Information Processing Systems), FOCS (Symposium on Foundations of Computer Science), MAPR (Mathematical Programming journal) 2018-Now
Co-organizer of ACO student seminar, Georgia Institute of Technology 2018