Xin Zhang

Ph.D. in Statistics

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Research Interests

Distributed Statistical Learning, Deep Learning, Sparsity Learning, Reinforcement Learning.

Education

Iowa State University, Ames, IA — *08/2016 - 12/2020*
Ph.D., Statistics
Advisors: Prof. Zhengyuan Zhu and Prof. Jia (Kevin) Liu

Fudan University, Shanghai, China — *09/2012 - 06/2016*
Bachelor of Science, Mathematics and Applied Mathematics

Conference Papers

1. **Zhang, X.**, Liu, J., Zhu, Z. and Bentley, E.S. Low Sample and Communication Complexities in Decentralized Learning: A Triple Hybrid Approach. In *Proc. IEEE INFOCOM 2021.* (acceptance rate: 19.9%)
2. **Zhang, X.**, Liu, J. and Zhu, Z., 2020. Taming Convergence for Asynchronous Stochastic Gradient Descent with Unbounded Delay in Non-Convex Learning. In *Proc. IEEE CDC 2020.*
3. Yang, H., **Zhang, X.**, Fang M. and Liu J. Adaptive Multi-Hierarchical signSGD for Communication-Efficient Distributed Optimization. In *Proc. IEEE SPAWC 2020.*
4. **Zhang, X.**, Fang, M., Liu, J. and Zhu, Z. Private and Communication-Efficient Edge Learning: A Sparse Differential Gaussian-Masking Distributed SGD Approach. In *Proc. ACM Mobihoc 2020.* (acceptance rate: 15%)
5. **Zhang, X.**, Liu, J., Zhu, Z., and Bentley, E. S. Communication-Efficient Network Distributed Optimization with Differential-Coded Compressors. In *Proc. IEEE INFOCOM 2020.* (acceptance rate: 19.8%)
6. Yang, H., **Zhang, X.**, Fang M. and Liu J. Byzantine-Resilient Stochastic Gradient Descent for Distributed Learning: A Lipschitz-Inspired Coordinate-wise Median Approach. In *Proc. IEEE CDC 2019.*
7. **Zhang, X.**, Liu, J., Zhu, Z. and Bentley, E.S. Compressed Distributed Gradient Descent: Communication-Efficient Consensus over Networks. In *Proc. IEEE INFOCOM 2019.* (acceptance rate: 19.7%)

Journal Articles

1. **Zhang, X.**, Li, L., Ng, M.K. and Zhang, S., 2017. Drug–target interaction prediction by integrating multiview network data. *Computational Biology and Chemistry*, 69, pp.185-193.
2. **Zhang, X.**, Gao, W.G. and Su, Y., 2015. Electricity consumer archetypes study based on functional data analysis and k-means algorithm. *Power System Technology*, 39, pp.3153-3162.

In Preparation

- **Zhang, X.**, Liu J. and Zhu, Z.. Distributed Linear Model Clustering over Networks: A Tree-Based Fused-Lasso ADMM Approach. arXiv preprint arXiv:1905.11549 (2019). *Submitted*
- **Zhang, X.**, Liu, J., Zhu, Z. and Bentley, E.S. GT-STORM: Taming Sample, Communication, and Memory Complexities in Decentralized Non-Convex Learning. *Submitted*
- **Zhang, X.**, Yu, S., Wang, X. and Zhu, Z. Spatial Heterogeneous Additive Partial Linear Model: A Joint Approach of Bivariate Spline and Forest Lasso.

- **Zhang, X.**, Zhu, Z., 2019. Spatial CUSUM for Signal Region Detection. arXiv preprint arXiv:1904.03246.
- Liu, Z., **Zhang, X.** and Liu, J. On Convergence and Generalization of Semi-Asynchronous-SpiderBoost for Non-Convex Optimization. *Submitted*
- Liu, Z., **Zhang, X.** and Liu, J. Nonconvex Primal-Dual Stochastic Recursive variance reduced Gradient Descent for Policy Evaluation.

Research Experience

Research Assistant, Center for Survey Statistics & Methodology
Supervisors : Prof. Zhengyuan Zhu *01/2017 - 12/2020*

- Developed the adaptive tree-based/forest lasso penalties for model-based clustering analysis.
- Applied clustering methods to remote sensing data (MODIS Data) for spatial cluster detection.
- Designed parallel computing algorithm to accelerate the process of image data analysis.
- Applied deep neural network model (Unet, GANs) to idenfity road pixels.

Research Assistant, Network Informatics and Learning Research Group
Supervisor : Prof. Jia (Kevin) Liu *01/2018 - 12/2020*

- Developed message compression algorithms in network to reduce communication cost.
- Developed differential private network algorithms to protect data privacy.
- Developed stochastic varaince reduction method in network to reduced computation complexity.

Teaching Experience

Teaching Assistant
Dept. Statistics, Iowa State University, Ames, IA *08/2016 - 05/2017*

- STAT 341 (Spring 2017), Instructor: Kevin Kasper
- STAT 430 (Fall 2016), Instructor: Dr. Kris De Brabanter
- STAT 341 (Fall 2016), Instructor: Kevin Kasper

Professional Experience

Facebook, Inc., Menlo Park, CA *05/2020 - 08/2020*
Software Engineer Intern, Machine Learning

Awards

- **Vince Sposito Statistical Computing Award**, Department of Statistics, Iowa State University, 2020. This award is for outstanding Ph.D. students in statistical computing.
- **The Holly C. and E. Beth Fryer Award**, Department of Statistics, Iowa State University, 2018. This award is for top second-year Ph.D. students in the department.
- **Outstanding Graduate of Fudan Unversity**, Fudan University, 2016.
- **First Prize of the scholarship for Outstanding Students at Fudan University** (5%), Fudan University, 2015.
- **Third Prize of the scholarship for Outstanding Students at Fudan University**, Fudan University, 2013-2014.

Skills

Projects in: R, Python, C++, PHP, SQL, Matlab, LATEX, Markdown.
Familiar with: Unix shell, SAS, HTML, Microsoft Office, Pytorch, Tensorflow.
Language: Proficient in English. Native in Chinese.

Reference

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Prof. Jia (Kevin) Liu
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College of Engineering
The Ohio State University
420 Dreese Laboratories
2015 Neil Ave
Columbus, OH 43210
Office Phone: (614)247-4588
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Prof. Dan Nettleton
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