Shanshan Wu

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Education

The University of Texas at Austin   Aug. 2014 – present

- Ph.D., Electrical & Computer Engineering, current GPA: 4.0/4.0
- Advisors: Prof. Sujay Sanghavi and Prof. Alex Dimakis
- **Research interests**: large-scale machine learning, optimization and numerical linear algebra, distributed algorithms

Shanghai Jiao Tong University   Sept. 2011 – Mar. 2014

- M.S., Electronics Science & Technology, GPA: 3.95/4.0 (rank: 1/25)
- Advisor: Prof. Xudong Wang
- Excellent Graduate Student Scholarship (top 3%), 2013

Shanghai Jiao Tong University   Sept. 2007 – July 2011

- B.S., Electrical & Computer Engineering, GPA: 3.94/4.0 (rank: 1/134)
- University of Michigan - Shanghai Jiao Tong University Joint Institute (UM-SJTU JI)
- National Scholarship (top 3%), 2007/2008/2009

Publications

- Single Pass PCA of Matrix Products
  Shanshan Wu, Srinadh Bhojanapalli, Sujay Sanghavi, and Alex Dimakis
  Advances in Neural Information Processing Systems (**NIPS**) *2016*

- Leveraging Sparsity for Efficient Submodular Data Summarization
  Erik Lindgren, **Shanshan Wu**, and Alex Dimakis
  Advances in Neural Information Processing Systems (**NIPS**) *2016.*

- Sparse and Greedy: Sparsifying Submodular Facility Location Problems
  Erik Lindgren, **Shanshan Wu**, and Alex Dimakis
  NIPS workshop Optimization for Machine Learning (**NIPS OPT**) *2015.*

 Before joining UT-Austin:

- Performance study on a CSMA/CA-Based MAC protocol for multi-user MIMO Wireless LANs
  Shanshan Wu, Wenguang Mao, and Xudong Wang
  Journal version in *IEEE Transactions on Wireless Communications* (**TWC**), 2014.
  Conference version in *IEEE **GLOBECOM***, 2013.

- Distributed Opportunistic Scheduling with QoS Constraints for Wireless Networks with Hybrid Links
  Wenguang Mao, Xudong Wang, and **Shanshan Wu**
  Journal version in *IEEE Transactions on Vehicular Technology* (**TVT**), 2015.
  Conference version in *IEEE **GLOBECOM***, 2013.

Selected Projects

Single Pass PCA of Matrix Products   Feb. 2015 – May 2016
- Design the first one-pass algorithm that can directly produce a low rank approximation of matrix products.
- Prove theoretical guarantee in terms of the spectral norm.
- Implement in Apache Spark; demonstrate the superior performance on Amazon EC2 clusters and 150GB dataset.
- Scala code is available at https://github.com/wushanshan/MatrixProductPCA

Collaborative Ranking from Pairwise Comparisons   Sept. 2014 – Dec. 2014
- Implement a new collaborative ranking algorithm AltSVM which takes only pairwise comparisons as training data.
- Compare the statistical performance of AltSVM and Factorization Machines on real-world datasets.

Random Access Multi-User MIMO Wireless LANs   Aug. 2012 – Dec. 2013
- Develop a theoretical model to capture the throughput and delay performance of a MU-MIMO WLAN.
- Propose a new opportunistic MAC protocol, which achieves significantly better throughput-delay performance.

Teaching Experiences
- Teaching Assistant, EE381V (Machine Learning for Large Scale Data), UT-Austin, Spring 2016.
- Teaching Assistant, EE313 (Linear Systems and Signals), UT-Austin, Fall 2014.
- Teaching Assistant, VE489 (Computer Networks), UM-SJTU JI, Summer 2013.
- Teaching Assistant, VP140 (Physics I), UM-SJTU JI, Summer 2009.

Selected Honors and Awards
- Excellent Graduate Student Scholarship (top 3%), SJTU, 2013.
- National Scholarship (top 3%), Ministry of Education of China, 2007/2008/2009.
- Academic Excellence Scholarship (First-Class, top 1%), SJTU, 2007/2008.
- First Prize, National High School Physics Competition, Jiangsu Province, China, 2006.
- Second Prize, National High School Mathematics Competition, Jiangsu Province, China, 2006.

Professional Activities
- Reviewer: IEEE Trans. on Mobile Computing / Vehicular Technology, ACM/Springer Wireless Networks.
- Volunteer reviewer: NIPS 2016

Graduate Courses taken at UT-Austin

Mathematics:
- Large-Scale Optimization
- Probability and Stochastic Processes
- Information Theory
- Advanced Probability in Learning, Inference, and Networks
- Estimation Theory

Algorithms:
- Data Mining
- Algorithms: Techniques/Theory
- Advanced Algorithms
- Sublinear Algorithms

Programming Skills
- Languages: Matlab, Python, Scala
- Data-processing libraries: Apache Spark MLlib, GraphX, Python scikit-learn, XGBoost
- Operating systems: Mac OS X, Red Hat Linux, Windows