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

Advisor: Prof. Sujay Sanghavi and Prof. Alex Dimakis

Research interests: large-scale machine learning, design and analysis of scalable algorithms in distributed/multicore systems

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

Thesis: Impact of physical layer techniques on wireless networks

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)

Selected Projects

Single Pass PCA of Matrix Products Feb. 2015 – Feb. 2016

- Design a new one-pass algorithm for direct computing low rank approximation of matrix product.
- Derive an approximation guarantee on the spectral norm of residual matrix.
- Implement it in Apache Spark; evaluate its statistical and computational performance over synthetic and real datasets.

Collaborative Ranking from Pairwise Comparisons Sept. 2014 – Dec. 2014

- Implement a new algorithm AltSVM in MATLAB which involves solving two alternating soft-margin SVM problems.
- Evaluate the performance of AltSVM on MovieLens dataset and compare with the results of libFM.

Random Access Multi-User MIMO Wireless LANs Aug. 2012 – Dec. 2013

- Develop an analytical model to characterize the saturation throughput and mean access delay of a MU-MIMO WLAN.
- Optimize the network performance over key parameters for both the original scheme and its opportunistic variation.

Routing Path Selection in Two-Way Relay Networks Jan. 2012 – July 2012

- Determine the tradeoff relation between energy efficiency and bandwidth efficiency of a multi-hop network.
- Propose an information theoretical framework to select the optimal routing path.

Publications

- Erik Lindgren, **Shanshan Wu**, and Alex Dimakis, "Sparse and Greedy: Sparsifying Submodular Facility Location Problems", in *NIPS workshop Optimization for Machine Learning* (OPT2015).
- Wenguang Mao, Xudong Wang, and **Shanshan Wu**, "Distributed Opportunistic Scheduling with QoS Constraints for Wireless Networks with Hybrid Links," in *IEEE Transactions on Vehicular Technology*, 2015.

- **Shanshan Wu**, Wenguang Mao, and Xudong Wang, "Performance study on a CSMA/CA-Based MAC protocol for multi-user MIMO Wireless LANs," in *IEEE Transactions on Wireless Communications*, vol. 13, no. 6, June 2014.
- **Shanshan Wu**, Wenguang Mao, and Xudong Wang, "Performance analysis of random access multi-user MIMO wireless LANs," in *Proceedings of the IEEE GLOBECOM*, 2013.
- **Shanshan Wu**, Wenguang Mao, and Xudong Wang, "Information-theoretic study on routing path selection in two-way relay networks," in *Proceedings of the IEEE GLOBECOM*, 2013.
- Wenguang Mao, **Shanshan Wu**, and Xudong Wang, "QoS-Oriented Distributed Opportunistic Scheduling for Wireless Networks with Hybrid Links," in *Proceedings of the IEEE GLOBECOM*, 2013.

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.
- Student Travel Grant for IEEE GLOBECOM 2013.
- Capstone Design Silver Award, UM-SJTU JI, Dec. 2010.
- Li & Fung Scholarship, University of Hong Kong, Jan. 2010.
- National Scholarship (top 3%), Ministry of Education, China, 2007-2008, 2008-2009, 2009-2010 (3 times).
- Academic Excellence Scholarship (First-Class, top 1%), SJTU, 2007-2008, 2008-2009 (2 times).
- First Prize, National High School Physics Competition, Jiangsu Province, China, 2006.
- Second Prize, National High School Mathematics Competition, Jiangsu Province, China, 2006.

Professional Activities

Technical reviewer for

- IEEE Transactions on Mobile Computing
- IEEE Transactions on Vehicular Technology
- ACM/Springer Wireless Networks

Graduate Courses

- At UT-Austin: Data Mining (EE380L), Large-Scale Optimization (EE381V), Probability and Stochastic Processes (EE381J), Advanced Algorithms (EE381V), Information Theory (EE381K), Algorithms: Techniques/Theory (CS388G), Advanced Probability in Learning, Inference, and Networks (EE381V)
- At SJTU: Linear Systems, Wireless Communication Theory, Computer Networks, Complex Networks, Random Process, Introduction to Coding and Information Theory.
- Online at edX: Scalable Machine Learning (CS190.1x), Introduction to Big Data with Apache Spark (CS100.1x).

Programming Skills

- Languages: Matlab, Python, Scala
- Distributed computing platform: Apache Spark (MLlib, GraphX)
- Operating systems: Mac OS X, Linux, Windows