

# Shanshan Wu

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1616 Guadalupe St, UTA 7.518  
Austin, TX 78701

Email: [shanshan@utexas.edu](mailto:shanshan@utexas.edu)  
Webpage: <http://wushanshan.github.io/>

## 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. Alexandros G. 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 Alexandros G. Dimakis  
*Advances in Neural Information Processing Systems (NIPS) 2016*
- Leveraging Sparsity for Efficient Submodular Data Summarization  
Erik M. Lindgren, **Shanshan Wu**, and Alexandros G. Dimakis  
*Advances in Neural Information Processing Systems (NIPS) 2016.*
- Sparse and Greedy: Sparsifying Submodular Facility Location Problems  
Erik M. Lindgren, **Shanshan Wu**, and Alexandros G. 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

### Rescaled Johnson–Lindenstrauss

Aug. 2016 – Dec. 2016

- Design a new data-oblivious dimensionality reduction method that empirically outperforms the standard JL lemma.
- Develop theoretical guarantee for pairwise Euclidean distances and dot product similarity.

### 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.

## 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

- Student Travel Award, NIPS 2016.
- Excellent Graduate Student Scholarship (top 3%), SJTU, 2013.
- National Scholarship (top 3%), Ministry of Education of China, 2007/2008/2009.
- First Prize, National High School Physics Competition, Jiangsu Province, China, 2006.
- Second Prize, National High School Mathematics Competition, Jiangsu Province, China, 2006.

## Professional Activities

- Journal 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