JIAMING XU

http://web.ics.purdue.edu/~xu972/

431 Krannert Building

Purdue University, West Lafayette, IN, 47907

RESEARCH INTERESTS

Network science, machine learning, high-dimensional statistical inference, information theory, optimization, stochastic systems, game theory, mean-field theory, communications and networking

EDUCATION

University of Illinois at Urbana-Champaign
    Ph.D. in Electrical and Computer Engineering   Dec. 2014
    Advisor: Prof. Bruce Hajek
    Dissertation: "Statistical inference in networks: fundamental limits and efficient algorithms"

University of Texas at Austin
    M.S. in Electrical and Computer Engineering   May 2011
    Advisor: Prof. Jeffrey Andrews

Tsinghua University
    B.E. in Electrical Engineering   July 2009

AWARDS

Simons-Berkeley Research Fellowship	2016
The Wharton Dean's Post-Doctoral Fellowship	2015
Outstanding Graduate Student Award, College of Engineering, UIUC	2014
Fellowship of Academic Excellence, Tsinghua University	2008, 2007, 2006
First Prize in Chinese Physics Olympiad in Zhejiang Province	2005

WORK EXPERIENCE

Krannert School of Management, Purdue University

Assistant Professor   Aug. 2016 – present

Simons Institute for the Theory of Computing, UC Berkeley

Research Fellow, under program "Counting Complexity & Phase Transitions"   Jan. 2016 – May 2016

Statistics Department, The Wharton School, University of Pennsylvania

Post-Doctoral Fellow, with Prof. Elchanan Mossel   Jan. 2015 – Dec. 2015

Coordinated Science Laboratory, UIUC

Research Assistant, with Prof. Bruce Hajek   June 2011 – Dec. 2014

Technicolor Research Laboratory, Paris, France

Research Intern, with Dr. Laurent Massoulié and Dr. Marc Lelarge   June 2012 – Sept. 2012

Wireless Networking & Communications Group, UT Austin

Research Assistant, with Prof. Jeffrey Andrews   Aug. 2009 – May 2011

TEACHING EXPERIENCE

Instructor, Probability with Engineering Applications, UIUC   Summer 2014
  – Lectured for 50 mins every weekday for eight weeks in the class with 60 undergraduate students
  – Designed and graded problem sets and exams, held office hours, and used Piazza for Q&A

Teaching Assistant, Analysis & Design of Communication Networks, UT Austin   Spring 2011

Teaching Assistant, Digital Logic Design, UT Austin   Spring 2010

Teaching Assistant, Data Structures, UT Austin   Spring 2010, Fall 2009

PREPRINTS

1. J. Banks, C. Moore, R. Vershynin, and J. Xu, "Information-theoretic bounds and phase transitions in clustering, sparse PCA, and submatrix localization." arXiv 1607.05222, July 2016.

2. Y. Chen, X. Li, and J. Xu, "Convexified modularity maximization for degree-corrected stochastic block models," Dec. 2015. arXiv 1512.08425.

3. B. Hajek, Y. Wu, and J. Xu, "Recovering a hidden community beyond the spectral limit in $O(|E|\log^*|V|)$ time," Oct. 2015. arXiv:1510.02786.

4. B. Hajek, Y. Wu, and J. Xu, "Submatrix localization via message passing," Oct. 2015. arXiv:1510.09219.

5. B. Hajek, Y. Wu, and J. Xu, "Information limits for recovering a hidden community," Sept. 2015. arXiv:1509.07859.

PEER-REVIEWED JOURNAL PUBLICATIONS

1. B. Hajek, Y. Wu, and J. Xu, "Achieving exact cluster recovery threshold via semidefinite programming: Extensions," *IEEE Trans. Inf. Theory.*, Apr. 2016.

2. B. Hajek, Y. Wu, and J. Xu, "Achieving exact cluster recovery threshold via semidefinite programming," *IEEE Trans. Inf. Theory.*, Jan. 2016.

3. M. Lelarge, L. Massoulié, and J. Xu, "Reconstruction in the labeled stochastic block model," *IEEE Transactions on Network Science and Engineering*, Oct. 2015.

4. Y. Chen and J. Xu, "Statistical-computational tradeoffs in planted problems and submatrix localization with a growing number of clusters and submatrices," *Journal of Machine Learning Research*, Aug. 2015.

5. J. Xu and B. Hajek, "The supermarket game," *Stochastic Systems*, no. 3, pp. 405–441, 2013.

6. J. Xu, J. Andrews, and S. Jafar, "MISO broadcast channels with delayed finite-rate feedback: Predict or observe?," *IEEE Trans. Wireless Commun.*, vol. 11, pp. 1456–1467, Apr. 2012.

7. J. Xu, J. Zhang, and J. Andrews, "On the accuracy of the Wyner model in cellular networks," *IEEE Trans. Wireless Commun.*, vol. 10, pp. 3098–3109, Sept. 2011.

PEER-REVIEWED CONFERENCE PROCEEDINGS

1. F. Krzakala, J. Xu, and L. Zdeborová, "Mutual information in rank-one matrix estimation," in *Proceedings of IEEE Information Theory Workshop (ITW)*, Sept. 2016. arXiv 1603.08447.

2. B. Hajek, Y. Wu, and J. Xu, "Information limits for recovering a hidden community," in *Proceedings of IEEE International Symposium on Information Theory (ISIT)*, July 2016.

3. B. Hajek, Y. Wu, and J. Xu, "Semidefinite programs for exact recovery of a hidden community," in *Proceedings of Conference on Learning Theory (COLT)*, June 2016.

4. E. Mossel and J. Xu, "Density evolution in the degree-correlated stochastic block model," in *Proceedings of Conference on Learning Theory (COLT)*, June 2016. arXiv:1509.03281.

5. E. Mossel and J. Xu, "Local algorithms for block models with side information," in *Proceedings of Innovations in Theoretical Computer Science (ITCS)*, Jan. 2016.

6. S. Oh, K. K. Thekumparampil, and J. Xu, "Collaboratively learning preferences from ordinal data," in *Proceedings of Neural Information Processing Systems (NIPS)*, Dec. 2015.

7. B. Hajek, Y. Wu, and J. Xu, "Achieving exact cluster recovery threshold via semidefinite programming," in *Proceedings of IEEE International Symposium on Information Theory (ISIT)*, June 2015.

8. B. Hajek, Y. Wu, and J. Xu, "Computational lower bounds for community detection on random graphs," in *Proceedings of Conference on Learning Theory (COLT)*, June 2015.

9. R. Wu, J. Xu, R. Srikant, L. Massoulié, M. Lelarge, and B. Hajek, "Clustering and inference from pairwise comparisons," in *Proceedings of ACM SIGMETRICS*, June 2015.

10. B. Hajek, S. Oh, and J. Xu, "Minimax-optimal inference from partial rankings," in *Proceedings of Neural Information Processing Systems (NIPS)*, Dec. 2014.

11. Y. Chen and J. Xu, "Statistical-computational phase transitions in planted models: The high-dimensional setting," in *Proceedings of International Conference on Machine Learning (ICML)*, June 2014.

12. J. Xu, R. Wu, K. Zhu, B. Hajek, R. Srikant, and L. Ying, "Jointly clustering rows and columns of binary matrices: Algorithms and trade-offs," in *Proceedings of ACM SIGMETRICS*, June 2014.

13. J. Xu, L. Massoulié, and M. Lelarge, "Edge label inference in generalized stochastic block models: from spectral theory to impossibility results," in *Proceedings of Conference on Learning Theory (COLT)*, June 2014.

14. M. Lelarge, L. Massoulié, and J. Xu, "Reconstruction in the labeled stochastic block model," in *Proceedings of IEEE Information Theory Workshop (ITW)*, Sept. 2013.

15. J. Xu and B. Hajek, "The supermarket game," in *Proceedings of IEEE International Symposium on Information Theory (ISIT)*, July 2012.

16. J. Xu, J. Andrews, and S. Jafar, "The net benefit of delayed finite-rate feedback in the MISO broadcast channel," in *Proceedings of Annual Allerton Conference on Communication, Control, and Computing (Allerton)*, Sept. 2011.

17. J. Xu, J. Zhang, and J. Andrews, "On the accuracy of the Wyner model in downlink cellular networks," in *Proceedings of IEEE International Conference on Communications (ICC)*, June 2011.

18. J. Xu, J. Zhang, and J. Andrews, "When does the Wyner model accurately describe an uplink cellular network?," in *Proceedings of IEEE Global Telecommunications Conference (GLOBECOM)*, Dec. 2010.

INVITED PAPERS

1. B. Hajek, Y. Wu, and J. Xu, "Achieving exact cluster recovery threshold via semidefinite programming under the stochastic block model," in *Proceedings of Asilomar Conference on Signals, Systems, and Computers*, Nov. 2015.

2. B. Hajek, Y. Wu, and J. Xu, "Exact recovery threshold in the binary censored block model," in *Proceedings of IEEE Information Theory Workshop (ITW)*, Oct. 2015.

SELECTED SEMINARS AND TALKS

1. "Finding a hidden community in networks: where is the hard regime?", Simons Institute at UC Berkeley, Apr. 2016

2. "Community detection in networks: algorithms, complexity, and information limits", Imperial College London Business School, Dec. 2015.

3. "Achieving exact cluster recovery threshold via semidefinite programming under the stochastic block model", Asilomar Conference on Signals, Systems, and Computers, Nov. 2015.

4. "Recovering a hidden community in networks", School of Electrical Engineering, Korea Advanced Institute of Science and Technology, Oct. 2015.

5. "Exact recovery threshold in the binary censored block model", Information Theory Workshop (ITW), Oct. 2015.

6. "On the optimality of local belief propagation under the degree-correlated stochastic block model", Information Theory Workshop (ITW), Oct. 2015.

7. "Information and computation limits for recovering a hidden community in Networks", HajekFest: A Workshop on Networks, Games, and Algorithms, UIUC, Oct. 2015.

8. "Achieving exact cluster recovery threshold via semidefinite programming", **Semi-Plenary Talks**, International Symposium on Information Theory (ISIT), June 2015.

9. "Community detection in networks: understanding the fundamental limits of polynomial-time algorithms", IDeAS seminar, PACM, Princeton University, Apr. 2015.

10. "Community detection in networks: fundamental limits and efficient algorithms", **Graduation-Day Talks**, Information Theory and Applications Workshop (ITA), Feb. 2015.

11. "Statistical inference in networks: fundamental limits and efficient algorithms", Electrical Engineering Seminar Series, Harvard, Jan. 2015.

12. "Fundamental limits for community detection", Research Group Seminar, Department of Statistics, University of California, Berkeley, Oct. 2014.

13. "Fundamental limits for community detection", Information Theory Forum, Department of Electrical Engineering, Stanford University, Sept. 2014.

14. "Fundamental limits for community detection", Department Seminar, Wharton Statistics Department, University of Pennsylvania, Aug. 2014.

15. "Statistical and computational phase transitions in planted models", Artificial Intelligence & Information Systems Seminar, Department of Computer Science, UIUC, Mar. 2014.

16. "Statistical and computational phase transitions in planted models", CSL Communications Seminar, Department of Electrical and Computer Engineering, UIUC, Nov. 2013.

17. "The supermarket game", Technicolor Paris Research Lab, June 2012.

PROFESSIONAL SERVICE

Organizer of Coordinated Science Laboratory Student Conference 2014, 2013

Reviewer for *Annals of Statistics, IEEE Trans. Inf. Theory, IEEE Transactions on Network Science and Engineering, Queueing Systems, IEEE Trans. Wireless Commun., IEEE J. Sel. Areas Commun.*