
Education

- 2012–2017 **Doctor of Philosophy**, *Electrical Engineering, Columbia University*, New York.
Advisor: Prof. Xiaodong Wang
- 2010–2012 **Master of Philosophy**, *Electronic and Computer Engineering, Hong Kong University of Science and Technology*, Hong Kong.
Advisor: Prof. Matthew McKay
- 2006–2010 **Bachelor of Science with Minor in Economics**, *Electrical Engineering & Computer Science, Peking University*, Beijing.
Advisor: Prof. Lingyang Song

Work Experience

- Nov. 2016 – present **Senior Inventive Scientist**, *AT&T Labs-Research*, 200 S Laurel Ave, Middletown, NJ.
- Network security: Researched and designed machine learning algorithm to detect hacking activities, device purchase fraud, and other security threats. This project aims to increase AT&T's visibility to malicious cyber-activities, and protect internet users from cyber-crimes.
 - Deep learning: Researched and developed convolutional neural network models to identify poles via street-view images and build virtual world for 5G network planning. This project potentially saves millions of dollars spent on site-inspection for small cells deployment.
 - Summer intern mentor: Created Natural Language Processing and text mining models to analyze government regulations for 5G network planning.
- Sep. 2017 – **Adjunct Professor**, *Columbia University*, New York.
- Dec. 2017
- Taught graduate-level course—ELEN6873 Detection and Estimation Theory
 - Mentored visiting scholar and Ph.D. student

Research Interest

Intersection of sequential analysis, statistical signal processing, sensor fusion, information theory, with applications to cyber-security. Recent research includes deep learning and computer vision.

Publications

Google Scholar citations: 160 as of April 28, 2018. Please refer to my Google Scholar page for updated figures: <https://scholar.google.com/citations?user=POzN8xcAAAAJ&hl>

Journal

- [1] **Shang Li** and Xiaodong Wang, “Fully Distributed Sequential Hypothesis Testing: Algorithms and Analyses”, *IEEE Trans. on Information Theory*, vol. 64, no. 4, pp. 2742-2758, Apr. 2018.
- [2] **Shang Li**, Xiaoou Li, Xiaodong Wang, and Jingchen Liu, “Decentralized Sequential Composite Hypothesis Test Based on One-Bit Communication”, *IEEE Trans. on Information Theory*, vol. 63, no. 6, pp. 3405-3424, Jun. 2017.
- [3] **Shang Li** and Xiaodong Wang, “Optimal Joint Detection and Estimation Based on Decision-Dependent Bayesian Cost”, *IEEE Transactions on Signal Processing*, vol. 64, no. 10, pp. 2573-2586, May 2016.
- [4] **Shang Li** and Xiaodong Wang, “Cooperative Change Detection for Voltage Quality Monitoring in Smart Grids”, *IEEE Trans. on Information Forensics and Security*, vol. 11, no. 1, pp. 86-99, Jan. 2016.

- [5] **Shang Li**, Yasin Yilmaz, and Xiaodong Wang, “Quickest Detection of False Data Injection Attack in Wide-Area Smart Grids”, *IEEE Trans. on Smart Grid*, vol. 6, no. 6, pp. 2725-2735, Nov. 2015.
- [6] **Shang Li** and Xiaodong Wang, “Quickest Attack Detection in Multi-Agent Reputation Systems”, *IEEE Journal of Selected Topics in Signal Processing*, vol. 8, no. 4, pp. 653-666, Aug. 2014.
- [7] **Shang Li**, Matthew McKay, and Yang Chen, “On the Distribution of MIMO Mutual Information: An In-Depth Painlevé-Based Characterization”, *IEEE Trans. on Information Theory*, vol. 59, no. 9, pp. 5271-5296, Sep. 2013.
- [8] Leian Chen, **Shang Li**, and Xiaodong Wang, “Quickest Fault Detection in Photovoltaic Systems”, *IEEE Trans. on Smart Grid*, vol. 9, no. 3, pp. 1835-1847, May 2018.
- [9] Ziyu Guo, **Shang Li**, Xiaodong Wang, and Wei Heng, “Distributed Point-Based Gaussian Approximation Filtering for Forecasting-Aided State Estimation in Power Systems”, *IEEE Trans. on Power Systems*, vol. 31, no. 4, pp. 2597-2608, Jul. 2016.
- [10] Yasin Yilmaz, **Shang Li**, and Xiaodong Wang, “Sequential Joint Detection and Estimation: Optimum Tests and Applications”, *IEEE Trans. on Signal Processing*, vol. 64, no.20, pp. 5311-5326, Jun. 2016.

Conference

- [11] **Shang Li** and Xiaodong Wang, “Asymptotic Optimality of Consensus-Based Sequential Probability Ratio Test”, *The 42nd IEEE International Conference on Acoustics, Speech and Signal Processing (ICASSP)*, 5-9 Mar., New Orleans, 2017.
- [12] **Shang Li**, Xiaou Li, Xiaodong Wang, and Jingchen Liu, “Optimal Sequential Test with Finite Horizon and Constrained Sensor Selection”, *IEEE Int. Sym. on Inf. Theory (ISIT)*, 10-15 Jul., Barcelona, 2016.
- [13] **Shang Li**, Xiaou Li, Xiaodong Wang, and Jingchen Liu, “Multi-Sensor Generalized Sequential Probability Ratio Test Using Level-Triggered Sampling”, *IEEE Global Conference on Signal & Information Processing*, 15-18 Dec., Orlando, FL, 2015.
- [14] **Shang Li** and Xiaodong Wang, “Joint Composite Detection and Bayesian Estimation: A Neyman-Pearson Approach”, *IEEE Global Conference on Signal & Information Processing*, 15-18 Dec., Orlando, FL, 2015.
- [15] **Shang Li**, Yasin Yilmaz, and Xiaodong Wang, “Sequential Cyber-Attack Detection in the Large-Scale Smart Grid System”, *IEEE Int. Conf. on Smart Grid Communications*, 2-5 Nov., Miami, FL, 2015.
- [16] **Shang Li** and Xiaodong Wang, “Monitoring Disturbances in Smart Grids Using Distributed Sequential Change Detection”, *IEEE International Workshop on Computational Advances in Multi-Sensor Adaptive Processing*, 15-18 Dec., St. Martin, 2013. — **Finalist of the Best Student Paper.**
- [17] **Shang Li**, Matthew McKay, and Yang Chen, “Characterizing the mutual information distribution of MIMO systems: Beyond the Gaussian approximation”, in proc. of the 46th Annual Asilomar Conference on Signals, Systems and Computers.
- [18] **Shang Li**, Yang Chen, and Matthew McKay, “Mutual information distribution of interference-limited MIMO: A joint Coulomb Fluid and Painlevé based approach”, in proc. of the 45th Annual Asilomar Conference. — **Finalist of the Best Student Paper.** See [here](#).

Preprints

- [19] **Shang Li** and Xiaodong Wang, “Distributed Sequential Hypothesis Testing with Quantized Message-Exchange”, *Submitted to IEEE Trans. on Information Theory*, 2017.
- [20] **Shang Li**, Xiaou Li, Xiaodong Wang, and Jingchen Liu, “Optimal sequential test with finite horizon and constrained sensor selection”, *Submitted to IEEE Trans. on Information Theory*, 2017.

Invited Talks

- Mar. 2017 International Conference on Acoustics, Speech and Signal Processing, New Orleans
- Oct. 2016 Intel Labs, San Jose
- Sep. 2016 BMW Technology, Chicago
- Apr. 2016 New England Statistics Symposium, Yale University, New Haven
- Feb. 2016 Department of Statistics, Columbia University, New York

Academic Services

Reviews for Journals (25 invitations)

- IEEE Transactions: Information Theory (1), Signal Processing (4), Signal and Information Processing over Networks (4), Wireless Communication (3), Aerospace and Electronic Systems (1), Smart Grid (3)
- IEEE Access (3)
- Security & Privacy (Wiley) (2)
- Digital Signal Processing (Elsevier) (1)
- Signal Processing (Elsevier) (1)
- Statistica Sinica (1)
- KSII Transactions on Internet and Information Systems (1)

Reviews for Conferences (8 invitations)

ICC'2014&2017, ITW'2013, ISIT'2014, SPCOM'2014, BMSB'2016

Awards & Recognitions

- 2018 Collaborative Research Award, Electrical Engineering Department, Columbia University
- 2013 Wei Family Foundation Scholarship, Columbia University
- 2013 Finalist of the Best Student Paper Award at CAMSAP
- 2011 Finalist of the Best Student Paper Award at Asilomar Conference
- 2010 HKUST Graduate Scholarship
- 2009 Peking University Chun-Tsung Undergraduate Research Grant
- 2009 Peking University SK Scholarship

Computer Skills

Operating Systems Unix/Linux, Mac OS, Windows

Programming Languages Python (TensorFlow, Keras, scikit-learn, Pandas), R, Matlab, C++, L^AT_EX

(update: April 28, 2018)