

Junting Chen

Work Address

University of Southern California
3740 McClintock Ave, EEB 508
Los Angeles, CA 90089, USA
juntingc@usc.edu

Education

- **The Hong Kong University of Science and Technology, Hong Kong SAR China** 2009 – 2015
Ph.D. in Electronic and Computer Engineering
Thesis: Design and analysis of iterative algorithms via nonlinear control theory
Advisor: Professor Vincent K. N. Lau
- **Massachusetts Institute of Technology, Cambridge, MA, USA** 2014 – 2015
Visiting Ph.D. student
Research: Game theoretic methods for resource allocation in wireless network localization
Advisor: Professor Moe Z. Win
- **Nanjing University, Nanjing, China** 2005 – 2009
B.S. in Electronic Engineering
Thesis: Intelligent identification system based on remote iris recognition
Advisor: Professor Jie Yuan

Research Interests

Current research interests include signal processing, optimizations, nonlinear control, and statistical learning, with applications to wireless communications and localization. In particular, current works include UAV-assisted wireless communications, source localization, precoding and feedback design for massive MIMO systems, and game theoretical approaches for cooperative network localization.

Work Experience

- **University of Southern California, Los Angeles, CA, USA**
Postdoctoral Research Fellow, Ming Hsieh Department of Electrical Engineering 2016 – current
Advisor: Professor Urbashi Mitra
Project: Signal processing techniques for source localization and communications. Submitted 1 journal publication.
- **EURECOM, Biot, France**
Postdoctoral Research Fellow, Department of Communication Systems 2015 – 2016
Advisor: Professor David Gesbert
Project: Developed learning and optimization algorithms for cellular communications assisted by unmanned aerial vehicles (UAVs). Developed advanced feedback, precoding, and user grouping strategies for limited feedback MIMO systems enabled by device-to-device communications. Developed 3 European patent applications, published 2 journal papers, and 1 journal publication in preparation.
- **Massachusetts Institute of Technology, Cambridge, MA, USA**
Research Assistant, Laboratory for Information and Decision Systems (LIDS) 2014 – 2015
Advisor: Professor Moe Z. Win
Project: Developed a game theoretical resource allocation framework for efficient network localization under various application scenarios, published 2 journal papers.
- **The Hong Kong University of Science and Technology, Hong Kong SAR China**
Research Assistant, Center for Wireless Information Technology (CenWIT) 2009 – 2015

Advisor: Professor Vincent K. N. Lau

Project: Developed a framework for iterative algorithm design and analysis for resource allocation in wireless communication systems under time-varying channels, with applications to multi-timescale tracking for optimal cross-layer resource allocation, delay-aware communications, and low complexity massive MIMO precoding. Published 7 journal papers (5 first-author).

- **National Instruments (NI), Shanghai, China**

Software Engineer Intern, LabVIEW Software Team

Spring 2009

Developed and improved an automatic test platform (ATP) for the software compatibility test on the hardware modules, programmed in LabVIEW.

Teaching Experience

- **University of Southern California, Los Angeles, CA, USA**

Guest Lecturer, Ming Hsieh Department of Electrical Engineering

2017

Course: Probability for Electrical and Computer Engineers (EE503)

Summary: Delivered a guest lecture.

- **Massachusetts Institute of Technology, Cambridge, MA, USA**

Teaching Assistant, Department of Aeronautics and Astronautics

2014

Course: Statistics and Probability (16.09), Statistics for Engineering and Scientists (16.434/6.434)

Summary: Helped develop teaching materials including lectures, problem sets, solutions, review notes, and exams. Assisted students with questions in homework and course materials. Graded examinations.

- **The Hong Kong University of Science and Technology, Hong Kong SAR China**

Guest Lecturer, Teaching Assistant, Department of Electronic and Computer Engineering 2009 – 2013

Course: Computer Communication Systems (ELEC4120), Digital Communications (ELEC4410), Wireless Communication (ELEC5460), Broadband Wireless Communications (EESM5539), Advanced Computer and Networking Architectures (EESM5670)

Summary: Delivered review and tutorial sessions. Helped develop teaching materials including lecture notes, problem sets, solutions, review notes, and exams. Assisted students with questions in homework and course materials. Graded examinations.

Mentoring Experience

- Co-mentored junior graduate/undergraduate students:

Amr Elnakeeb (PhD student at USC, 2017), Akshayaa Magesh (visiting student at USC, 2017), Omid Esrafilian (graduate student at EURECOM, 2016), Uday Yatnalli (visiting graduate student at EURECOM, 2016), Fuxing Zhuang (master student at HKUST, 2013)

Project Experience

- European Research Council (3/16 –): *Cooperation Techniques for Future Communication Systems*
- Huawei Technologies, Paris, France (9/14 – 2/16): *Advanced Massive MIMO Algorithms*
- Huawei Technologies, Beijing, China (6/12 – 5/13): *Radio Resource Management for LTE Heterogeneous Networks*
- Hong Kong Applied Science and Technology Research Institute, Hong Kong SAR China (9/09 – 8/10): *WiMAX Simulation Platform*
- Huawei Technologies, Shenzhen, China (9/09 – 8/10): *Advanced MIMO Simulation Platform*

Talks

- "Underwater acoustic source localization using unimodal-constrained matrix factorization", Asilomar Conference on Signals, Systems, and Computers, Pacific Grove, CA, November 1, 2017.

- “Rotated eigenstructure analysis for source localization without energy-decay models”, International Conference on Digital Signal Processing, London, August 24, 2017.
- “Learning for flying relays in cellular communications” (invited), Robotics: Science and Systems, MIT, Cambridge MA, July 16, 2017
- “Underwater Acoustic Source Localization without Energy-decay Models”, EURECOM, France, June 1, 2017
- “Learning radio maps for UAV-aided wireless networks: a segmented regression approach” (poster), IEEE International Conference on Communications, Paris, May 24, 2017.
- “Optimal positioning of flying relays for wireless networks: a LOS map approach”, IEEE International Conference on Communications, Paris, May 23, 2017.
- “Optimal dimensionality reduction In correlated massive MIMO systems with quantized channel feedback”, Communication Theory Workshop (poster), Nafplio, Greece, May 16, 2016
- “Optimal dimensionality reduction In limited feedback correlated massive MIMO systems: from single user to multiuser case”, Technical University of Munich, Munich, Germany, May 3, 2016
- “Large deviation delay analysis of queue-aware multiuser MIMO systems with two timescale mobile-driven feedback” (poster), IEEE International Conference on Acoustics, Speech, and Signal Processing, Vancouver, May 2013.
- “An analysis of verifications in microblogging social networks – Sina Weibo”, International Conference on Distributive Computer System Workshop, Macau, June 2012.
- “Convergence analysis of saddle point problems in time-varying wireless systems – control theoretical approach” (poster), IEEE International Conference on Acoustics, Speech, and Signals Processing, Kyoto, March 2012.

Honors and Awards

- **SENG Overseas Research Award**, The Hong Kong University of Science and Technology, 2013
- **SPS Travel Grant**, IEEE Signal Processing Society, 2013
- **HKTIIT Post-Graduate Excellence Scholarships**, The Hong Kong University of Science and Technology, 2012
- **HKUST Research Travel Grant**, The Hong Kong University of Science and Technology, 2012, 2013
- **Champion in NI VI Cup Electronic Design Competition (2008)**, National Instruments, Shanghai, China 2008
- **First class award in Intel Cup National Undergraduate Electronic Design Contest**, Ministry of Education of China, 2008
- **National scholarship**, Nanjing University (3 out of 160 students awarded), 2008
- **SAMSUNG scholarship**, Nanjing University (2 out of 160 awarded), 2008
- **Social service scholarship**, Nanjing University, 2007
- **People scholarship (first class honor)**, Nanjing University, 2006

Professional Service

- Technical Program Committee (TPC) Member:
 - IEEE VTC, Spring 2015, Fall 2015
- Reviewer for various international conferences
- Reviewer for journals (selected):

- IEEE Journal on Selected Areas in Communications
- IEEE Journal of Selected Topics in Signal Processing
- IEEE Trans. on Signal Processing
- IEEE Trans. on Wireless Communications
- IEEE Trans. on Communications
- IEEE Trans. on Mobile Computing
- IEEE Trans. on Vehicular Technology
- IEEE Communications Letters
- IEEE Wireless Communications Letters

Professional Memberships

- Institute for Electrical and Electronics Engineers (IEEE), Student Member, 2012 – 2014
- Institute for Electrical and Electronics Engineers (IEEE), Member, 2015 – present

References

(Available upon request.)

Publications

Journal Papers

- [J14] **J. Chen**, U. Mitra, “Matrix Factorization for Nonparametric Multi-source Localization Exploiting Unimodal Properties”, under review, preprint arXiv:1711.07457, 2017.
- [J13] **J. Chen**, D. Gesbert, “Local map-assisted positioning for flying wireless relays”, in preparation, 2017.
- [J12] **J. Chen**, H. Yin, L. Cottatellucci, D. Gesbert, “Dual-regularized Feedback and Precoding for D2D Assisted MIMO Systems,” *IEEE Trans. Wireless Commun.*, vol. 16, no. 10, pp. 6854–6867, 2017.
- [J11] **J. Chen**, H. Yin, L. Cottatellucci, D. Gesbert, “Efficient feedback mechanisms for FDD massive MIMO under user-level cooperation,” *IEEE Trans. Wireless Commun.*, vol. 16, no. 8, pp. 5162–5175, 2017.
- [J10] **J. Chen**, W. Dai, Y. Shen, and M. Z. Win, “Resource Management Games for Distributed Network Localization,” *IEEE J. Sel. Areas Commun.*, vol. 35, no. 2, pp. 317–329, Feb. 2017.
- [J9] **J. Chen**, W. Dai, Y. Shen, and M. Z. Win, “Power management for cooperative localization: A game theoretical approach,” *IEEE Trans. Signal Process.*, vo. 64, no. 24, pp. 6517–6532, Dec. 2016.
- [J8] **J. Chen** and V. K. N. Lau, “Convergence analysis of mixed timescale cross-layer stochastic optimization,” 2015, under revision, preprint: arXiv: 1305.0153.
- [J7] A. Liu, V. K. N. Lau, F. Zhuang, and **J. Chen**, “Two timescale joint beamforming and routing for multi-antenna D2D networks via stochastic cutting plane,” *IEEE Trans. Signal Process.*, vol. 63, no. 18, pp. 4854–4865, 2015.
- [J6] A. Liu, V. K. N. Lau, L. Ruan, **J. Chen**, and D. Xiao, “Hierarchical radio resource optimization for heterogeneous networks with enhanced inter-cell interference coordination (eICIC),” *IEEE Trans. Signal Process.*, vol. 62, no. 7, pp. 1684–1693, Jan. 2014.
- [J5] **J. Chen** and V. K. Lau, “Two-tier precoding for FDD multi-cell massive MIMO time-varying interference networks,” *IEEE J. Sel. Areas Commun.*, vol. 32, no. 6, pp. 1230–1238, Jun. 2014.
- [J4] **J. Chen** and V. K. Lau, “Large deviation delay analysis of queue-aware multi-user MIMO systems with two-timescale mobile-driven feedback,” *IEEE Trans. Signal Process.*, vol. 61, no. 16, pp. 4067–4076, May 2013.
- [J3] **J. Chen** and V. K. N. Lau, “Delay analysis of max-weight queue algorithm for time-varying wireless ad hoc networks – Control theoretical approach,” *IEEE Trans. Signal Process.*, vol. 61, no. 1, pp. 99–108, Oct. 2013.
- [J2] **J. Chen** and V. K. N. Lau, “Convergence analysis of saddle point problems in time-varying wireless systems – Control theoretical approach,” *IEEE Trans. Signal Process.*, vol. 60, no. 1, pp. 443–452, 2012.
- [J1] **J. Chen**, V. K. N. Lau, and Y. Cheng, “Distributive network utility maximization over time-varying fading channels,” *IEEE Trans. Signal Process.*, vol. 59, no. 5, pp. 2395–2404, May 2011.

Refereed Conference Proceedings

- [C17] **J. Chen**, O. Esrafilian, D. Gesbert, and U. Mitra, “Efficient algorithms for air-to-ground channel reconstruction in UAV-aided communications,” in *Proc. IEEE Global Telecomm. Conf.*, Dec. 2017, Wi-UAV workshop.
- [C16] **J. Chen** and U. Mitra, “Underwater Acoustic Source Localization using Unimodal-constrained Matrix Factorization”, in *Proc. Asilomar Conf. on Signals, Systems, and Computers*, Pacific Grove, CA, Nov. 2017.
- [C15] **J. Chen** and U. Mitra, “Rotated Eigenstructure Analysis for Source Localization without Energy-decay Models”, in *Proc. Int. Conf. Digital Signal Process.*, London, Aug. 2017.
- [C14] **J. Chen** and D. Gesbert, “Optimal Positioning of Flying Relays for Wireless Networks: A LOS Map Approach”, in *Proc. IEEE Int. Conf. Commun.*, Paris, May 2017.

- [C13] **J. Chen**, U. Yatnalli, and D. Gesbert, "Learning Radio Maps for UAV-aided Wireless Networks: A Segmented Regression Approach", in *Proc. IEEE Int. Conf. Commun.*, Paris, May 2017.
- [C12] **J. Chen**, H. Yin, L. Cottatellucci, and D. Gesbert, "Dual-regularized precoding: A robust approach for D2D-enabled massive MIMO," in *Proc. Asilomar Conf. on Signals, Systems, and Computers*, Pacific Grove, CA, USA, Nov. 6-9, 2016.
- [C11] **J. Chen** and D. Gesbert, "Joint user grouping and beamforming for low complexity massive MIMO systems", in *Proc. IEEE Int. Workshop Signal Process. Adv. Wireless Commun.*, Edinburgh, Jul. 2016.
- [C10] **J. Chen**, H. Yin, L. Cottatellucci, and D. Gesbert, "Precoder feedback versus channel feedback in massive MIMO under user cooperation," in *Proc. Asilomar Conf. on Signals, Systems, and Computers*, 2015.
- [C9] A. Liu, V. K. N. Lau, F. Zhuang, and **J. Chen**, "Mixed timescale cross layer optimization for multi-antenna D2D networks," in *Proc. IEEE Global Telecomm. Conf.*, San Diego, CA, Dec. 2015.
- [C8] **J. Chen**, W. Dai, Y. Shen, K. N. Lau, Vincent, and M. Z. Win, "Power management game for cooperative localization in asynchronous networks," in *Proc. IEEE Int. Conf. Commun.*, London, Jun. 2015, pp. 1506–1511.
- [C7] **J. Chen** and V. K. N. Lau, "Multi-stream iterative SVD for massive MIMO communication systems under time varying channels," in *Proc. IEEE Int. Conf. Acoustics, Speech, and Signal Process.*, Florence, May 2014, pp. 3152–3156.
- [C6] N. Wang, J. She, and **J. Chen**, "How "big Vs" dominate Chinese microblog: a comparison of verified and unverified users on Sina Weibo," in *Proc. ACM Conf. Web Sci.*, New York, Jun. 2014, pp. 182–186.
- [C5] **J. Chen** and V. K. N. Lau, "Convergence analysis of mixed timescale cross-layer stochastic optimization," in *Proc. Asilomar Conf. on Signals, Systems, and Computers*, Pacific Grove, CA, Nov. 2013, pp. 225–229.
- [C4] **J. Chen** and V. K. N. Lau, "Large deviation delay analysis of queue-aware multiuser MIMO systems with two timescale mobile-driven feedback," in *Proc. IEEE Int. Conf. Acoustics, Speech, and Signal Process.*, Vancouver, May 2013, pp. 5036–5040.
- [C3] A. Liu, V. K. N. Lau, L. Ruan, **J. Chen**, and D. Xiao, "Hierarchical radio resource optimization for heterogeneous networks with dynamic ABS," in *Proc. IEEE Int. Conf. Commun.*, Budapest, Jun. 2013, pp. 5194–5198.
- [C2] **J. Chen** and J. She, "An analysis of verifications in microblogging social networks – Sina Weibo," in *Proc. Int. Conf. Distrib. Comput. Syst. Workshop (ICDCSW)*, Macau, Jun. 2012, pp. 147–154.
- [C1] **J. Chen** and V. K. N. Lau, "Convergence analysis of saddle point problems in time-varying wireless systems – control theoretical approach," in *Proc. IEEE Int. Conf. Acoustics, Speech, and Signal Process.*, Kyoto, Mar 2012, pp. 3093-3096.

Patents

- [P5] **J. Chen**, H. Yin, L. Cottatellucci, and D. Gesbert, "A user communication device and method for cellular communication with a base station and D2D communication," European Patent Application, PCT/EP2016/075849, filed Oct. 26, 2016.
- [P4] **J. Chen** and D. Gesbert, "Devices and methods arranged to support user communication device grouping in a communication network," European Patent Application, PCT/EP2016/075803, filed Oct. 26, 2016.
- [P3] **J. Chen**, H. Yin, L. Cottatellucci, and D. Gesbert, "Adaptive CSI sharing mechanism for D2D enabled precoding in massive MIMO," European Patent Application, PCT/EP2016/069606, filed Aug. 18, 2016.
- [P2] V. K. N. Lau, A. Liu, **J. Chen**, D. Xiao, and T. Wu, "Dynamic resource block allocation method, apparatus, base station and system," Chinese Patent Application, PCT/CN2013/081180, filed Aug. 9,

2013.

- [P1] V. K. N. Lau and **J. Chen**, "Large deviation delay analysis of queue-aware multi-user MIMO systems with multi-timescale mobile-driven feedback," US Patent US9755711, filed Apr. 15, 2014, issued Sep. 5, 2017.

Theses

- Doctoral thesis: "*Design and Analysis of Iterative Algorithms via Nonlinear Control Theory*," Department of Electronic and Computer Engineering, The Hong Kong University of Science and Technology, Hong Kong SAR China, Jan 2015, thesis advisor: Professor Vincent K. N. Lau.