

Wencen Wu

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Professional Positions

Assistant Professor Department of Computer Engineering San Jose State University	Aug. 2018 – present San Jose, CA
Assistant Professor Department of Electrical, Computer, and Systems Engineering Rensselaer Polytechnic Institute	Nov. 2013 – June 2018 Troy, NY
Postdoctoral Fellow School of Electrical and Computer Engineering Georgia Institute of Technology	Aug. 2013 – Oct. 2013 Atlanta, GA

Education

Ph.D. in Electrical and Computer Engineering Georgia Institute of Technology, Atlanta, GA Sigma Xi Best Ph.D Thesis Award	Aug 2013
M.Sc. in Electrical and Computer Engineering Georgia Institute of Technology, Atlanta, GA	Mar 2010
M.Sc. in Electronic, Information and Electrical Engineering Shanghai Jiao Tong University, Shanghai, China	Mar 2009
B.Sc. in Electronic, Information and Electrical Engineering Shanghai Jiao Tong University, Shanghai, China	Jun 2006

Research Interests

Robotics, machine learning, estimation theory, and control theory as applied to cyber-physical systems and autonomous multi-robot systems in challenging tasks

Sponsored Research Projects:

- **SJSU eCampus Technology Equipment Program:** “Using Turtlebots in Mobile Robots Course”; amount: \$7,500.00; duration: Spring 2019.
- **NSF CMMI Program:** “Modeling, Identification, and Estimation of Distributed Parameter Systems Using Mobile Sensor Networks”, sole PI; award number: 1663073; amount: \$358,250.00; duration: 2017 - 2019. Transferred to SJSU in Feb. 2019; award number: 1917300; amount: \$298,157.00.
- **NSF CPS Program,** “CPS: Synergy: Collaborative Research: Towards Effective and Efficient Sensing-Motion Co-Design of Swarming Cyber-Physical Systems”, Lead PI; award number: 1446461; total amount: \$987,783.00; PI’s portion: \$258,161.00; duration: 2015 - 2018.

Teaching

San Jose State University

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| • Machine Learning (CMPE257) | Fall 2018, Fall 2019 |
| • Special Topics in Autonomous Driving (CMPE297) | Spring 2019, Fall 2019 |
| • Special Topics in Mobile Robots (CMPE189) | Spring 2019, Fall 2019 |
| • Large Scale Analytics (CMPE256) | Spring 2020 |

Rensselaer Polytechnic Institute

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| • Engineering Probability (ECSE 2500) | Spring 2017 |
| • Optimal Control Theory (ECSE 6440) | Spring 2016, Spring 2014 |
| • Control Systems Engineering (ECSE4440) | Fall 2015 |
| • Digital Control Systems (ECSE4510) | Spring 2015 |
| • Robotics I (CSE4480/6966) | Fall 2014 |

Publications

Peer-reviewed Book Chapters

- D. Chang, **W. Wu**, and F. Zhang, “Glider CT: Analysis and Experimental Validation”, in *Distributed Autonomous Robotic Systems*, ser. Springer Tracts in Advanced Robotics. Springer, Volume 112, 285 - 298, 2016.
- D. Chang, X. Liang, **W. Wu**, C. R. Edwards, and F. Zhang, “Real-time Modeling of Ocean Current for Navigating Underwater Glider Sensing Networks,” ser. *Studies in Computational Intelligence*, Springer, ch. *Cooperative Robots and Sensor Networks*. Volume 507, pp 61-75, 2014.

Peer-reviewed Journal Papers

- **W. Wu**, Y. Zhang, J. You, and M. Li, “Parameter Identification of Spatial-Temporal Varying Processes by a Multi-Robot System in Realistic Diffusion Fields”, *Robotica*, under review.
- S. Al-Abri, **W. Wu**, F. Zhang, “A Gradient-Free 3-dimensional Source Seeking Strategy with Robustness Analysis”, *IEEE Transactions on Automatic Control*, 64(8), 3439 - 3446, 2019.
- J. You and **W. Wu**, “Online Passive Identifier of Spatially Distributed Systems Using Mobile Sensor Networks”, *IEEE Transactions on Control Systems Technology*, 25(6), 2151 - 2159, 2017.
- D. Chang, **W. Wu**, C. R. Edwards, and F. Zhang, “Motion Tomography: A Tomographic Approach to Flow Modeling Using Mobile Sensor Networks”, *International Journal of Robotics Research*, 36(3), 320 - 336, 2017.
- J. You and **W. Wu**, “Cooperative Identification of Advection-Diffusion Processes with Spatially Varying Coefficients based on a Multi-model Structure”, *Cyber Physical Systems*, Taylor & Francis, accepted, 2017.
- **W. Wu** and F. Zhang, “A Speeding-up and Slowing-down Strategy for Distributed Source Seeking with Robustness Analysis”, *IEEE Transactions on Control of Networked Systems*, 3(3), 231-240, 2016.
- **W. Wu** and F. Zhang, “A Switching Strategy for Target Tracking by Mobile Sensing Agents,” *Journal of Communications*, 8(1), 47-54, 2013.
- **W. Wu** and F. Zhang, “Robust Cooperative Exploration with a Switching Strategy,” *IEEE Transactions on Robotics*, 28(4), 828-839, 2012.
- **W. Wu** and F. Zhang, “Cooperative Exploration of Level Surfaces of Three Dimensional Scalar Fields,” *Automatica*, the IFAC Journal, 47(9), 2044-2051, 2011.
- **W. Wu**, H. Zhao, W. Liu and W. Tao, “Effects of Illumination on Image Quality in Precision Vision Measurement,” *Journal of Shanghai Jiao Tong University*, 43(6), 931-934, 2009.

Peer Reviewed Full-length Conference Papers

- W. Xie, **W. Wu**, B. Wang, J. You, Z. Ye, and Q. Zhou, “Simulation-Based Blockchain Design To Secure Biopharmaceutical Supply Chain”, *2019 Winter Simulation Conference*, accepted, 2019.
- S. Chatterjee and **W. Wu**, “A Modular Approach to Level Curve Tracking with Two Nonholonomic Mobile Robots”, *15th IEEE/ASME International Conference on Mechatronic and Embedded Systems and Applications*, accepted, 2019.
- P. Amin, N. R. Anikireddypally, S. Khurana, S. Vadakkemadathil, and **W. Wu**, “Personalized Health Monitoring using Predictive Analytics”, *2019 IEEE Fifth International Conference on Big Data Computing Service and Applications (BigDataService)*, 271 - 278, 2019.
- J. You and **W. Wu**, “Geometric Reinforcement Learning Based Path Planning for Mobile Sensor Networks in Advection-Diffusion Field Reconstruction”, in *Proc. of the IEEE International Conference on Decision and Control*, 1949 - 1954, 2018.
- J. You, **W. Wu**, and Y. Wang, “An adaptive Luenberger Observer for Speed-Sensorless Estimation of Induction Machines”, in *Proc. of the American Control Conference (ACC 2018)*, 307 - 312, 2018.
- J. You and **W. Wu**, “Sensing-Motion Co-Planning For Reconstructing a Spatially Distributed Field Using a Mobile Sensor Network”, in *Proc. of the IEEE International Conference on Decision and Control (CDC 2017)*, 3113 - 3118. (Invited paper)

- M. H. Jahnes, D. J. Glowny, T. A. Spafford, J. L. Clough, E. S. Herkenham, **W. Wu**, and A. A. Julius, “Generating Enthusiasm for Mathematics Through Robotics”, *2017 American Society for Engineering Education (ASEE) Annual Conference & Exposition*, 2017.
- S. Chatterjee and **W. Wu**, “Cooperative Curve Tracking in Two Dimensions Without Explicit Estimation of the Field Gradient”, in *Proc. of the IEEE 4th International Conference on Control, Decision and Information Technologies*, 0167-0712, 2017.
- J. You, Y. Zhang, M. Li, K. Su, F. Zhang, and **W. Wu**, “Cooperative Parameter Identification of Advection-diffusion Processes Using a Mobile Sensor Network”, in *Proc. of the American Control Conference (ACC 2017)*, 3230 - 3236, 2017. (Invited paper)
- M. Li, K. Su, Y. Zhang, J. You, and **W. Wu**, “Experimental Validation of Diffusion Coefficient Identification Using a Multi-Robot System”, in *Proc. of the 2016 IEEE MIT Undergraduate Research Technology Conference*, accepted, 2016.
- J. You, F. Zhang, and **W. Wu**, “Cooperative Filtering for Parameter Identification of Diffusion Processes”, in *Proc. of the IEEE Conference on Decision and Control (CDC 2016)*, 4327-4333, 2016. (Invited paper)
- L. Lu, J. You, and **W. Wu**, “Constrained Fast Source Seeking Using Two Nonholonomic Mobile Robots Without Gradient Estimation”, in *Proc. of the American Control Conference (ACC 2016)*, 7295-7301, 2016.
- **W. Wu**, A. Song, P. Varnell, and F. Zhang, “Cooperatively Mapping of the Underwater Acoustic Channel by Robot Swarms”, in *Proc. of the 9th ACM International Conference on UnderWater Networks and Systems (WUWNet14)*, Article no. 20, 2014.
- D. Chang, **W. Wu**, and F. Zhang, “Glider CT: Analysis and Experimental Validation”, in *Proc. of the International Symposium on Distributed Autonomous Robotic Systems*, 196-209, 2014. (**Best Paper Award Finalist**)
- **W. Wu**, F. Zhang, and Y. Wardi, “Target Localization: Energy-Information Trade-offs using Mobile Sensor Networks”, in *Proc. of the IEEE Conference on Decision and Control (CDC2014)*, 2944-2949, 2014.
- **W. Wu**, D. Chang, and F. Zhang, ”A Bio-inspired Robust 3D Plume Tracking Strategy Using Mobile Sensor Networks ,” in *Proc. of the IEEE Conference on Decision and Control (CDC2013)*, 4571-4578, 2013. (**Invited tutorial paper**)
- **W. Wu**, D. Chang, and F. Zhang, ”Glider CT: Reconstructing Flow Fields from Predicted Motion of Underwater Gliders”, in *Proc. of the 8th ACM International Conference on Underwater Networks & Systems (WUWNET13)*, Article No. 47, 2013.
- **W. Wu**, F. Zhang, and Y. Wardi, “Energy-Information Tradeoffs in Motion and Sensing for Target Localization,” in *Proc. of the European Control Conference (ECC2013)*, 1250-1255, 2013.
- D. Chang, **W. Wu**, D. R. Webster, M. Weissburg, and F. Zhang, “A Bio-inspired Pluming Tracking Algorithm for Mobile Sensing Swarms in Turbulent Flow,” in *Proc. of the IEEE International Conference on Robotics and Automation (ICRA2013)*, 921-926, 2013.
- **W. Wu** and F. Zhang, “Coherent Steps of Mobile Sensing Agents in Gaussian Scalar Fields,” in *Proc. of the 51th IEEE Conference on Decision and Control (CDC2012)*, pp. 2814-2819, 2012.
- **W. Wu**, I. D. Couzin, and F. Zhang, “Bio-inspired Source Seeking with no Explicit Gradient Estimation,” in *Proc. of the 3rd IFAC Workshop on Distributed Estimation and Control in Networked System (NecSys’12)*, 240-245, 2012. (**Best Student Paper Award Finalist**)
- X. Liang, **W. Wu**, D. Chang, and F. Zhang, “Real-time Modeling of Tidal Current for Navigating Underwater Glider Sensing Networks,” *Procedia Computer Science*, 10: 1121-1126, 2012.
- **W. Wu** and F. Zhang, “Explorability of Noisy Scalar Fields,” in *Proc. of the 50th IEEE Conference on Decision and Control (CDC2011)*, pp. 6439-6444, 2011.
- **W. Wu** and F. Zhang, “Experimental Validation of Source Seeking with a Switching Strategy,” in *Proc. of the 2011 IEEE International Conference on Robotics and Automation (ICRA2011)*, pp. 3835-3840, 2011.
- **W. Wu** and F. Zhang, “A Switching Strategy for Robust Cooperative Exploration,” in *Proc. of the 49th IEEE Conference on Decision and Control (CDC2010)*, pp. 5493-5498, 2010. (invited paper)

- **W. Wu** and F. Zhang, “Curvature Based Cooperative Exploration of Three Dimensional Scalar Fields,” in *Proc. of the 2010 American Control Conference (ACC2010)*, pp. 2909-2915, 2010.

Professional Activities

- **Grant Reviewer**
 - NSF EPCN program (2015, 2016), CPS program (2016), and HBCU-RISE program (2016)
- **Peer Reviewer** for Automatica, Robotica, Systems & Control Letters, Computer Networks, Cyber Physical Systems, IEEE Transactions on Robotics, IEEE Transactions on Automatic Control, IEEE Transactions on Control of Network Systems, IEEE Transactions on Control Systems Technology, IEEE Transactions on Cybernetics, IEEE Robotics and Automation Magazine, IEEE Robotics and Automation Letters, Journal of Marine Science and Engineering, IEEE International Conference on Robotics and Automation, IEEE Multi-conference on Systems and Control, IEEE International Conference on Decision and Control, IEEE/RSJ Conference on Intelligent Robots and Systems, American Control Conference, IEEE International Conference on Automation Science and Engineering, IEEE Global Communications Conference
- **Program Committee Member**
 - 2015 IEEE 82nd Vehicular Technology Conference
 - 2012 Georgia Tech Decision and Control (DCL) Student Symposium
 - IEEE Manufacturing Automation & Robotics Controls Technical Committee
- **Organizer** of the invited session: Recent Trends in Mobile Sensor Networks, 2015 IEEE Conference on Decision and Control
- **Publication Chair** of 2014 ACM International Conference on UnderWater Networks and Systems
- **Publicity Chair** of 2019 IEEE International Conference on Decentralized Applications and Infrastructures
- **Program co-Chair** of IEEE 2019 Industry Summit On Future Technology for Smart Cities
- **Program Organizing Committee Member** of 2019 and 2020 Silicon Valley Women in Engineering Conference
- **Symposium Co-Organizer** of 15th IEEE/ASME International Conference on Mechatronic and Embedded Systems and Applications

Service to SJSU

- Member of University Student Evaluation Committee (Fall 2018 - present)
- Member of College Undergraduate Curriculum Committee (Fall 2019 - present)
- Chair of Department Undergraduate Studies Committee (Fall 2019 - present)
- Member of Faculty Advisory Board of Engineering Ambassador’s Program (Fall 2019 - present)
- Faculty advisor of VR/AR club (Fall 2018 - present)
- Member of Department Graduate studies Committee (Fall 2018 - Spring 2019)
- Member of College Graduate Curriculum Committee (Spring 2019)

Honors And Awards

- Best Paper Award Finalist, 2014
International Symposium on Distributed Autonomous Robotic Systems
- Sigma Xi Best Ph.D Thesis Award, Georgia Institute of Technology, 2014
- Best Student Paper Award Finalist, 2012
IFAC Workshop on Distributed Estimation and Control in Networked Systems
- Best Presentation in Session Award, American Control Conference, 2010
- Coulter Fellowship, Georgia Institute of Technology, 2007 - 2009
- Excellent Academic Scholarship, Shanghai Jiao Tong University, 2002 - 2005