Jie Wang

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Research Interests: dynamic spectrum sharing, wireless sensor networking, and wireless testbeds

EDUCATION

Washington University in St. Louis Sept. 2019 - present
Ph.D. in Electrical Engineering (**GPA**: **3.98/4.0**) *Missouri, USA*
Advisor: Professor Neal Patwari

Sichuan University Sept. 2015–June 2019
B.S. in Electronics and Information Science and Technology (**GPA**: **3.80/4.0**) *Sichuan, China*

Sichuan University Sept. 2017–June 2019
B.A. in English (**GPA**: **91.4/100**) *Sichuan, China*

PROFESSIONAL EXPERIENCE

Washington University in St. Louis Sept. 2019 - present

Research Assistant

Project: Shadow Fading Modeling for Efficient and Accurate Received Power Prediction

- Designing a statistical spatial loss model for predicting correlated shadow fading and received power.
- Investigating different machine learning approaches for spatial loss model estimation.
- Validating the proposed solution via latency and accuracy metrics using both indoor and outdoor real-world datasets.

Project: Full-Duplex Spectrum Monitoring for Open Software-defined Radio (SDR) Platforms

- Developed a full-duplex monitoring system which enables simultaneous and continuous monitoring of the environment and platform's transmissions in a wide frequency range for shared spectrum compliance.
- Implemented the system on POWDER, a city-scale open wireless testbed for real-world Radio Frequency (RF) spectrum monitoring.
- Monitoring 19 SDR platforms on POWDER continuously for over a year with approximately 20 false alerts.

Project: Received Power Based Vital Sign Monitoring

- Implemented a received power based estimation algorithm for simultaneous respiration and pulse rate monitoring.
- Evaluated the algorithm's performance via experiments at various locations and with different subjects.

Project: Received Power Based Device-free Localization and Tracking

- Implemented custom-designed embedded system programming for wireless sensor networking and communication.
- Simulated link crossing speed estimation for indoor localization and tracking via received power.

Washington University in St. Louis Jan. 2021 - Dec. 2021

Teaching Assistant

Course: Communications Theory and Systems (ESE 471) with Dr. Neal Patwari
Course: Probability and Stochastic Processes (ESE 520) with Dr. Vladimir P. Kurenok

Sichuan University Aug. 2017 - July 2018

Research Intern

Project: Dielectric Characterization of Laterite Ores under Microwave Radiation

- Simulated a ridge waveguide for measuring the dielectric property of laterite ores under different temperatures.
- Estimated the relative complex permittivity of laterite ores using the designed neural network algorithm.

COURSEWORK

Washington University in St. Louis Sept. 2019 - present

- Detection and Estimation Theory • Large-Scale Optimization for Data Science • Bayesian Optimization
- Machine Learning • Data Mining • Wireless Sensor Networks • Communications Theory and Systems
- Recent Advances in Wireless and Mobile Networking • Equity and Fairness in Estimation and Classification

ACADEMIC SERVICE

- ACM SenSys Shadow Program Committee, 2022.
- ACM IPSN US Session Host, 2020.

SELECTED HONORS AND AWARDS

- iREDEFINE Professional Development Award, 2022.
- Top 1% Outstanding Graduate of Sichuan Province, 2018.
- Top 1% China National Scholarship, 2017/2018.
- Top 0.5% Li-xin Tang Scholarship, 2017.

SKILLS

- **Programming:** Python, C, C++, JavaScript, MATLAB, Bash.
- **Testbeds:** POWDER, PhantomNet.
- **Tools:** GNU Radio, MATLAB & Simulink, PyTorch, TensorFlow, Multisim, Altium.
- **Operating Systems:** Linux, MacOS, Windows.
- **Languages:** fluent in English, native in Chinese.

PUBLICATIONS

- **J. Wang**, A. Orange, L. Stoller, G. Wong, J. Van der Merwe, S. K. Kasera, and N. Patwari, "Full Duplex Spectrum Monitoring for Open Software-defined Radio Platforms," 2022, under review.
- M. A. Varner, F. Mitchell, **J. Wang**, K. Webb, G. D. Durgin, "Enhanced RF Modeling Accuracy Using Simple Minimum Mean-Squared Error Correction Factors," 2022, under review.
- M. G. Weldegebriel, **J. Wang**, N. Zhang and N. Patwari, "Pseudonymetry: Precise, Private Closed Loop Control for Spectrum Reuse with Passive Receivers," 2022. IEEE International Conference on RFID (RFID), pp. 91-96.
- **J. Wang**, J. Van der Merwe, and N. Patwari, "A Compliance Monitoring System for Open SDR Platforms," 2021. In Proceedings of the 19th ACM Conference on Embedded Networked Sensor Systems (SenSys), pp. 351–352.
- **J. Wang**, A. S. Abrar, N. Patwari, "Received Power Based Vital Sign Monitoring," 2021. Book chapter, Academic Press, pp. 205-230.
- W. He, Y. Huang, **J. Wang**, S. Zeng, "Homotopy Method for Optimal Motion Planning with Homotopy Class Constraints," 2022, under review.
- W. Ma, **J. Wang**, and L. Wu, "Research on dielectric characterization of laterite ores under microwave radiation," 2018. Journal of Microwave Power and Electromagnetic Energy, 52:4, 255-265.