Jintao Wang

Curriculum Vitae

University of Macau, Macao, China
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Education

Aug. 2020 - Present **Ph.D. in Electrical and Computer Engineering**, **University of Macau**, State Key Lab of Internet of Things for Smart City (SKL-IOTSC) and Department of Electrical and Computer Engineering (ECE)
Supervisor: Prof. Shaodan Ma (SMIEEE, Associate Director of SKL-IOTSC)

Sep. 2016 - Jun. 2020 **B.S. in Communication Engineering**, **Jilin University**, School of Communication Engineering

Professional Experience

Aug. 2022 - Nov. 2022 **Intern**, *Application Engineer*, Beijing Zengyi Technology Company
Responsibilities:
1. FPGA development for TDD switching of millimeter-wave frequency converter based on LTE frame structure with LABVIEW NXG.
2. Serial beam control of various millimeter wave antenna arrays based on Labview NXG.

Research Interests

Physical Layer Transmission

Massive MIMO, Reconfigurable Intelligent Surface (RIS), Integrated Sensing and Communication (ISAC), Wireless Power Transfer (WPT), mmWave Communication

Algorithm Design

Hardware Impairments, Transceiver Design, Beamforming Design, Prototype Platform Building

Convex Optimization

Discrete Optimization, Fractional Optimization

Research Projects

Jan. 2023 - Present **AI-Driven Intelligent 6G Wireless Communications: Theory and Technology**
Student Investigator, in charge of the design of transceiver, beamforming and prototype realization .
Funded by the National Natural Science Foundation of China (NSFC) and the Macao Science and Technology Development Fund (FDCT) under Grant 0087/2022/AFJ.

Oct. 2020 - Sep. 2022 **Analysis and Optimal Design of Simultaneous Wireless Information and Power Transfer in IoT Networks**
Student investigator, in charge of the prototype verification of wireless information and energy transmission based on NI USRP.
Funded by the Macao Science and Technology Development Fund (FDCT) under Grant 0036/2019/A1.

Publications

[J8] **Jintao Wang**, Chengzhi Ma, Shiqi Gong, Xi Yang, Shaodan Ma, "Joint Beamforming Optimization and Mode Selection for RDARS-aided MIMO Systems," submitted to *IEEE Transactions on Wireless Communications*.

[J7] **Jintao Wang**, Shiqi Gong, Qingqing Wu, Shaodan Ma, "RIS-aided MIMO systems with hardware impairments: Robust beamforming design and analysis," *IEEE Transactions on Wireless Communications*, vol. 22, no. 10, pp. 6914-6929, Oct. 2023. **(JCR Q1, IF: 10.4)**

[J6] Chengzhi Ma, **Jintao Wang**, Xi Yang, Guanghua Yang, Wei Zhang, Shaodan Ma, "RDARS Empowered Massive MIMO System: Two-Timescale Transceiver Design with Imperfect CSI," submitted to *IEEE Transactions on Wireless Communications*, under **Major Revision**.

[J5] Pingping Zhang, **Jintao Wang**, Yulin Shao, Shaodan Ma, "Integrated Sensing and Communication with Reconfigurable Distributed Antenna and Reflecting Surface: Joint Beamforming and Mode Selection," submitted to *IEEE Transactions on Communications*.

[J4] Shiqi Gong, **Jintao Wang**, Xin Zhao, Shaodan Ma, Chengwen Xing, "A Framework for Hardware Impairments-Aware Multi-Antenna Transceiver Design in IoT Systems via Majorization–Minimization," *IEEE Internet of Things Journal*, vol. 10, no. 1, pp. 417-433, 1 Jan.1, 2023. **(JCR Q1, IF: 10.6)**

[J3] Binggui Zhou, Xi Yang, **Jintao Wang**, Shaodan Ma, Feifei Gao, Guanghua Yang, "A Low-Overhead Incorporation-Extrapolation based Few-Shot CSI Feedback Framework for Massive MIMO Systems," submitted to *IEEE Transactions on Wireless Communications*, under **Major Revision**.

[J2] Chengzhi Ma, Xi Yang, **Jintao Wang**, Guanghua Yang, Wei Zhang, Shaodan Ma, "Reconfigurable Distributed Antennas and Reflecting Surface: A New Architecture for Wireless Communications," submitted to *IEEE Transactions on Communications*, under **Major Revision**.

[J1] Shiqi Gong, Chengwen Xing, Heng Liu, Xin Zhao, **Jintao Wang**, Jianping An, Tony QS Quek, "Hardware-Impaired RIS-Assisted mmWave Hybrid Systems: Beamforming Design and Performance Analysis," *IEEE Transactions on Communications*, vol. 71, no. 4, pp. 2317-2334, April 2023. **(JCR Q1, IF: 8.3)**

[C1] **Jintao Wang**, Chengwang Ji, Jiajia Guo, Shaodan Ma, "Demo: Reconfigurable Distributed Antennas and Reflecting Surface (RDARS)-aided Integrated Sensing and Communication System," *2023 IEEE/CIC International Conference on Communications in China (ICCC)*, Dalian, China, 2023, pp. 1-2.

Patents

[P1] Shaodan Ma, Xi Yang, Chengzhi Ma, Binggui Zhou, **Jintao Wang**. "A Distributed Hybrid RIS Enhanced Massive MIMO Wireless Communication System," **Chinese Patent Application**, Feb. 2023.

Demos

[D2] **RDARS for Localization**

Title: Reconfigurable Distributed Antennas and Reflecting Surface (RDARS)-Aided Integrated Sensing and Communication

Intro: The RDARS, a flexible and reconfigurable combination of distributed antennas and reflecting surface, is introduced to achieve the ISAC dual functionalities with only the communication signal. The developed RDARS-aided ISAC prototype achieves reliable user localization without compromising communication performance with beam scanning and range estimation.

[D1] **Vision-aided Multi-user Sensing and Communications**

Title: Vision-aided Multi-user Beam Training and Tracking for mmWave Massive MIMO Communications

Intro: We propose a novel vision-based framework that integrates visual data taken by a camera at the base station, to assist in the practical multi-user beam training and tracking. The vision-aided mmWave massive MIMO prototype achieves fast multi-user network access and reliable multi-user mobile communications, laying the foundation for scaling vision-aided wireless communication applications to real-world 6G scenarios and practical implementations.

Academic Services

Journal Referee

- IEEE Internet of Things Journal (IOT-J)
- IEEE Transactions on Wireless Communications (TWC)
- IEEE Transactions on Communications (TCOM)

Conference Reviewer

- Asia-Pacific Conference on Communications (APCC)
- International Conference on Future Communications and Networks (FCN)
- IEEE Vehicular Technology Conference (VTC)