Chengzhi Ma

Curriculum Vitae

University of Macau, Macao, China
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vitusmacz.github.io

Education

Aug. 2020 - Present **PhD Candidate 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 **Bachelor of Computer Science and Technology**, *Xiamen University*, School of Information

Professional Experience

Jul. 2023 - Present **Research Assistant**, *Jinan University*, School of Intelligent Systems Science and Engineering
Supervisor: Prof. Guanghua Yang (FIET, SMIEEE)

Oct. 2020 - Jul. 2022 **Teaching Assistant**, *University of Macau*, Department of Electrical and Computer Engineering

Research Interests

Physical Layer Transmission

Massive MIMO, Reconfigurable Intelligent Surface (RIS), Wireless Power Transfer (WPT), mmWave Communication

Algorithm Design

Transceiver Design, Beamforming Design, Prototype Platform Building

Convex 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 vision-aided beem steering 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.

Feb. 2023 - Present **Analysis and Optimal Design of Reconfigurable Distributed Antennas and Reflecting Surface (RDARS) for 6G**
Student Investigator, in charge of verify the performance of the RDARS-aided system with both theoretical analysis and experimental results.
Funded by the University of Macau under Grant MYRG-GRG2023-00116-FST-UMDF.

Publications

[1] **Chengzhi Ma**, Huan Zhang, Xi Yang, Shaodan Ma, "Massive MIMO Empowered Wireless Powered Sensor Networks: An Optimal Design With Statistical CSI," **IEEE Wireless Communications Letter**, vol. 22, no. 10, pp. 6914-6929, Oct. 2023.

[2] **Chengzhi Ma**, Xi Yang, Jintao Wang, Guanghua Yang, Wei Zhang, Shaodan Ma, "Reconfigurable Distributed Antennas and Reflecting Surface: A New Architecture for Wireless Communications," **IEEE Transactions on Communications**, doi: 10.1109/TCOMM.2024.3400915.

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

[4] Jintao Wang, **Chengzhi Ma**, Shaodan Ma, "Joint Beamforming Optimization and Mode Selection for RDARS-aided MIMO Systems," submitted to **IEEE Transactions on Wireless Communications**, under **Major Revision**.

[5] Jintao Wang, Binggui Zhou, **Chengzhi Ma**, Shiqi Gong, Guanghua Yang, Shaodan Ma, "Robust Beamforming Design and Antenna Selection for Dynamic HRIS-aided Massive MIMO Systems," submitted to **IEEE Transactions on Vehicular Technology**.

[6] Jintao Wang, **Chengzhi Ma**, Shaodan Ma, "Optimal Design of RDARS-aided Multi-user Systems with Low-resolution DACs," submitted to *the 25th IEEE International Workshop on Signal Processing Advances in Wireless Communications (SPAWC 2024)*.

Patents

* 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

* **RDARS-aided Wireless Communication Communications**

  Intro: Assisted in developing the RDARS-aided wireless communication system demo. To validate the feasibility and effectiveness of the proposed RDARS architecture, experiments are carried out with a fabricated prototype of RDARS to verify the performance of this proof-of-concept. (vitusmacz.github.io//research)

* **Vision-aided mmWave Massive MIMO Communications**

  Intro: Assisted in deploying visual data-aided beam steering mmWave massive MIMO prototype demo. 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.