

# Chengzhi Ma

## Curriculum Vitae

University of Macau, Macao, China

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🌐 [vitusmacz.github.io](https://vitusmacz.github.io)

### Education

- Aug. 2020 **PhD Candidate in Electrical and Computer Engineering**, *University of Macau*,  
- Present 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 **Bachelor of Computer Science and Technology**, *Xiamen University*, School of  
- Jun. 2020 Information

### Professional Experience

- Jul. 2023 **Research Assistant**, *Jinan University*, School of Intelligent Systems Science and  
- Present Engineering  
Supervisor: Prof. Guanhua Yang (FIET, SMIEEE)
- Oct. 2020 **Teaching Assistant**, *University of Macau*, Department of Electrical and Computer  
- Jul. 2022 Engineering

### Academic Services

#### Journal Referee

- IEEE Transactions on Wireless Communications (TWC)

#### Conference Reviewer

- IEEE Vehicular Technology Conference (VTC)

### 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

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## Research Projects

- Jan. 2023 **AI-Driven Intelligent 6G Wireless Communications: Theory and Technology**  
- Present Student Investigator, in charge of the design of vision-aided beam 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 **Analysis and Optimal Design of Reconfigurable Distributed Antennas and Reflecting Surface (RDARS) for 6G**  
- Present 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.

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## 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)*.

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## 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.

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## 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](https://github.com/vitusmacz/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.