

# YIDONG REN

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## RESEARCH INTERESTS

- **Sustainable IoT System:** Satellite IoT in rural areas [MobiCom'24 C2]. Cross-soil agricultural IoT [MobiCom'24 C3].
- **ML for IoT:** Neural enhanced signal encoder decoder co-design [MobiSys'24, MobiHoc'23, ICLR'23 ML4IoT].
- **Wireless Physical Layer:** Batteryless communication [INFOCOM'23, 25]. LoRa demodulation [MobiCom'24 C7].
- **Mobile Computing:** Wearable system authentication [SenSys'24]. Channel adapted WiFi [TMC'22]

## EDUCATION

<b>Michigan State University</b>	East Lansing, USA
Ph.D. Candidate, Department of Computer Science and Engineering	2021 – Present
Advisor: Zhichao Cao	

<b>University of Electronic Science and Technology of China</b>	Chengdu, China
B.E., Electronic and Information Engineering	2017 – 2021

## CONFERENCE PUBLICATIONS

\* denotes equal contribution, \_ are students I mentor

First-author papers:

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| <b>INFOCOM 2025</b> | <b>[C1]</b> AeroEcho: Towards Agricultural Low-power Wide-area Backscatter with Aerial Excitation Source.<br><b>Yidong Ren</b> , Gen Li, Yimeng Liu, Younsuk Dong, Zhichao Cao<br>IEEE Conference on Computer Communications, 2025<br><i>Acceptance ratio: 18.66%</i>  |
| <b>MobiCom 2024</b> | <b>[C2]</b> SateRIoT: High-performance Ground-Space Networking for Rural IoT.<br><b>Yidong Ren</b> , Amalinda Gamage, Li Liu, Mo Li, Shigang Chen, Younsuk Dong, Zhichao Cao.<br>The 30th Annual International Conference On Mobile Computing And Networking.<br><i>Acceptance ratio: 20.85%</i>   |
| <b>MobiCom 2024</b> | <b>[C3]</b> Demeter: Reliable Cross-soil LPWAN with Low-cost Signal Polarization Alignment.<br><b>Yidong Ren</b> , Wei Sun, Jialuo Du, Huaili Zeng, Younsuk Dong, Mi Zhang, Shigang Chen, Yunhao Liu, Tianxing Li, Zhichao Cao.<br>The 30th Annual International Conference On Mobile Computing And Networking.<br><i>Acceptance ratio: 20.85%</i>     |
| <b>MobiSys 2024</b> | <b>[C4]</b> ChirpTransformer: Versatile LoRa Encoding for Low-power Wide-area IoT.<br><b>Yidong Ren*</b> (co-primary author), Chenning Li*, Shuai Tong, Shakhrul Iman Siam, Mi Zhang, Jiliang Wang, Yunhao Liu, Zhichao Cao.<br>The 22nd ACM International Conference on Mobile Systems, Applications, and Services<br><i>Acceptance ratio: 16.35%</i> |
| <b>INFOCOM 2023</b> | <b>[C5]</b> Prism: High-throughput LoRa Backscatter with Non-linear Chirps.<br><b>Yidong Ren</b> , Puyu Cai, Jinyan Jiang, Jialuo Du, Zhichao Cao.<br>IEEE Conference on Computer Communications, 2023<br><i>Acceptance ratio: 19.21%</i>  |
| <b>ICNP 2022</b>    | <b>[C6]</b> Is Lorawan Really Wide? Fine-grained LoRa Link-level Measurement in An Urban Environment.<br><b>Yidong Ren*</b> (co-primary author), Li Liu*, Chenning Li*, Zhichao Cao and Shigang Chen.<br>The 30th IEEE International Conference on Network Protocols.<br><i>Acceptance ratio: 21.43%</i>   |

Other papers:

- |                     |  |
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| <b>MobiCom 2024</b> | <b>[C7]</b> LoRaTrimmer: Optimal Energy Condensation with Chirp Trimming for LoRa Weak Signal Decoding.<br>Jialuo Du, Yunhao Liu, <b>Yidong Ren</b> , Li Liu, Zhichao Cao.<br>The 30th Annual International Conference On Mobile Computing And Networking. |
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Acceptance ratio: 20.85%

**SenSys 2024** [C8] PiezoBud: A Piezo-Aided Secure Earbud with Practical Speaker Authentication. Gen Li\*, Huaili Zeng\*, Hanqing Guo, **Yidong Ren**, Aiden Dixon, Zhichao Cao and Tianxing Li. The 22nd ACM Conference on Embedded Networked Sensor Systems. Acceptance ratio: 18.53%

**MobiHoc 2023** [C9] SRLoRa: Neural-enhanced LoRa Weak Signal Decoding with Multi-gateway Super Resolution. Jialuo Du, **Yidong Ren**, Zhuizhu, Chenning Li, Zhichao Cao, Qiang Ma, Yunhao Liu. The 24th International Symposium on Theory, Algorithmic Foundations, and Protocol Design for Mobile Networks and Mobile Computing. Acceptance ratio: 22.06%

## JOURNAL PUBLICATIONS

**TMC** [J1] Morph: ChirpTransformer-based Encoder-decoder Co-design for Reliable LoRa Communication. **Yidong Ren**, Maolin Gan, Mi Zhang, Shigang Chen, Zhichao Cao. Under review of IEEE Transactions on Mobile Computing

**TMC** [J2] NELoRa: Towards Ultra-low SNR LoRa Communication with Neural-enhanced Demodulation. Maolin Gan\*, Khang Nguyen\*, Jialuo Du, **Yidong Ren**, Huacheng Zeng, Mi Zhang, Shigang Chen, Zhichao Cao. Under review of ACM Transactions on Internet of Things

**TMC** [J3] Channel Adapted Antenna Augmentation for Improved Wi-Fi Throughput. Yanbo Zhang, Weiping Sun, **Yidong Ren**, Sung-ju Lee, Mo Li. IEEE Transactions on Mobile Computing, 2022.

## BENCHMARK

**ICLR ML4IoT** NELoRa-Bench: A Benchmark for Neural-enhanced LoRa Demodulation. Jialuo Du, **Yidong Ren**, Mi Zhang, Yunhao Liu and Zhichao Cao. International Conference on Learning Representations Workshop on Machine Learning for IoT, 2023. **Oral**

## DEMO

**MobiCom 2024** Demeter-Demo: Demonstrating Cross-soil LPWAN with Low-cost Signal Polarization Alignment. **Yidong Ren**, Yawen Wang, Younsuk Dong, Shigang Chen, Mi Zhang, Jiliang Tang, Zhichao Cao. The 30th Annual International Conference On Mobile Computing And Networking (**Demo**)

## INTERNSHIP EXPERIENCE

**Qualcomm**, WLAN System Team. Santa Clara, CA, USA 06/2024 – 09/2024  
Research on *DNN-assisted Wi-Fi CSI localization* and *Deep reinforcement learning for Wi-Fi roaming*.

**Nanyang Technological University**, WADNS Group, Singapore 07/2019 – 10/2019  
Channel adaptive Wi-Fi intelligent antenna selection system. Advisor: Mo Li

## TEACHING EXPERIENCE

**Michigan State University**, Department of Computer Science and Engineering

Teaching Assistant

- CSE 220 — Programming in C Spring 2022, Spring 2023, Spring 2024
- CSE 891 — AIoT: Artificial Intelligence in the Edge Fall 2022

Guest Lecturer

- CSE 891 — AIoT: Artificial Intelligence in the Edge Fall 2023

## ACADEMIC SERVICE

**Programm Committee of**

- USENIX Security Artifact Evaluation 2025
- ACM MobiCom Artifact Evaluation 2024
- ACM MobiSys Artifact Evaluation 2024
- ACM SenSys Artifact Evaluation 2024

• IEEE International Conference on Parallel and Distributed Systems (ICPADS)	2024
<b>Invited Journal Reviewer of</b>	
• IEEE/ACM Transactions on Networking	2023-2024
• IEEE Transactions on Mobile Computing	2024
• ACM Transactions on Sensor Network	2022-2024
<b>Conference Reviewer of</b>	
• IEEE International Symposium on Dynamic Spectrum Access Networks (DySpan)	2022-2023
• EAI MobiQuitous	2022

## MENTORSHIP

<b>Puyu Cai</b>	02/2022-12/2022
Now: Master student at Computer Science Department, New York University	
<b>Khang Nguyen, Nam Nguyen</b>	03/2023 - Present
Now: Honor College, Michigan State University	

## HONOR AND AWARDS

Dissertation Completion Fellowship, Graduate School at Michigan State University	2025
Distinguished Artifact Reviewer, ACM MobiCom	2024
Student Travel Grant, ACM MobiCom	2024
Student Travel Grant, ACM MobiSys	2024
Student Travel Grant, ACM MobiHoc	2023
Student Travel Grant, IEEE ICNP	2022

## GRANTS EXPERIENCE

I assisted in the preparation of proposals for the following research grants:

**NSF:** LoRa Enabled Space-air-ground Integrated Networks for Next-Generation Agricultural IoT.  
Award number 2338976.

**NSF:** Towards High-Performing LoRa with Embedded Intelligence on the Edge.  
Award number 2312674.