Yidong Ren

Department of Computer Science and Engineering, Michigan State University, East Lansing, MI, 48824

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EDUCATION

Michigan State University – East Lansing, USA Sept 2021 – Present

PhD Candidate in Computer Science Advisor: Dr. Zhichao Cao

Research Interests: IoT | Mobile Computing | Wireless Networks | AI + wireless

Core Courses: Computer Networks and Communications, Distributed Systems, Design and Theory of Algorithms, Artificial Intelligence, Machine Learning, Data Mining, Artificial IoT, Wireless Communication **(GPA: 4.0/4.0)**

University of Electronic Science and Technology of China – Chengdu, China Sept 2017 – June 2021

Bachelor of Engineering Major: Electronic & Information Engineering

BENCHMARK | DATASETS

NELoRa-Bench: A Benchmark for Neural-enhanced LoRa Demodulation (Paper Code)
Jialuo Du, **Yidong Ren**, Mi Zhang, Yunhao Liu, Zhichao Cao
International Conference on Learning Representations **(ICLR 2023)** Workshop on ML for IoT **(Oral)** May. 5, 2023

CONFERENCE PUBLICATION

[C1] ChirpTransformer: Versatile LoRa Encoding for Low-power Wide-area IoT (To appear)
Chenning Li*, **Yidong Ren***, Shuai Tong, Shakhrul Iman Siam, Mi Zhang, Jiliang Wang, Yunhao Liu, Zhichao Cao
ACM International Conference on Mobile Systems, Applications, and Services **(MobiSys 2024)** Jun. 3 – 7, 2024
(* Co-primary author)

[C2] Demeter: Reliable Cross-soil LPWAN with Low-cost Signal Polarization Alignment (*To appear*)
Yidong Ren, Wei Sun, Jialuo Du, Huaili Zeng, Yonsuk Dong, Mi Zhang, Shigang Chen, Yunhao Liu, Tianxing Li, Zhichao Cao
ACM Annual International Conference On Mobile Computing And Networking **(MobiCom 2024)** Sep. 30 – Oct 4, 2024

[C3] SRLoRa: Neural-enhanced LoRa Weak Signal Decoding with Multi-gateway Super Resolution
Jialuo Du, **Yidong Ren**, Zhui Zhu, Chenning Li, Zhichao Cao, Qiang Ma, Yunhao Liu
ACM International Symposium on Mobile Ad Hoc Networking and Computing **(MobiHoc 2023)** Oct. 23 – 26, 2023
[Acceptance ratio: 30/136 = 22.1%]

[C4] Prism: High-throughput LoRa Backsactter with Non-linear Chirp (Paper)
Yidong Ren, Puyu Cai, Jingyan Jiang, Jialuo Du, Zhichao Cao
IEEE International Conference on Computer Communications **(INFOCOM 2023)** May. 17 – 20, 2023
[Acceptance ratio: 252/1312 = 19.2%]

[C5] Is LoRaWAN Really Wide? Fine-grained LoRa Link-level Measurement in An Urban Environment (Paper Code)
Yidong Ren*, Li Liu*, Chenning Li*, Zhichao Cao, Shigang Chen
IEEE International Conference on Network Protocols **(ICNP 2022)** Oct. 30 – Nov. 2, 2022
[Acceptance ratio: 33/154 = 21.4%] (* Co-primary author)

JOURNAL PUBLICATION

[J1] Channel Adapted Antenna Augmentation for Improved Wi-Fi Throughput (Paper)
Yanbo Zhang, Weiping Sun, **Yidong Ren**, Sung-ju Lee, Mo Li
IEEE Transactions on Mobile Computing **(TMC)** vol. 22, no. 11, pp. 6297-6310 Aug. 1, 2022

* denotes authors contributed equally

AWARDS

MobiHoc 2023 Student Travel Grant
ICNP 2022 2022 Student Travel Grant

PROJECT EXPERIENCE

[1] A Satellite Enabled Agricultural Distributed IoT system
Distributed LEO satellite assisted network system utilizing **machine learning** and **edge computing** for link estimation, data collection and analysis in rural areas without cellular infrastructure
Michigan State University, USA May. 2023 – Present

[2] A Large-scale Agriculture Data Collection and Analysis System with LoRa and AI
Develop advanced IoT systems based on embedded LoRa (long range communication) that integrate **signal processing**, **wireless communication**, and **deep learning** techniques.
Michigan State University, USA Aug. 2021 – Present

[3] Android APP Development for Multi-Modal Data Sensing in Smartphone
University of Chicago, Remote Apr. 2020 - July. 2020

[4] Atheros CSI Tool Upgrade (code)
Compile Linux kernel to accelerate and debug channel states information extraction tool. Implement micro-second level antenna selection scheme for Wi-Fi network with 802.11 protocol.
Nanyang Technological University, Singapore July. 2019 - Oct. 2019

Others: Internet of Things System Design and Implementation. Embedded system design (MCU: STM32 and RF modules). Implemented remote controlled intelligent vehicle, video game remote controller, intercom audio system, Wi-Fi communication.

SKILLS

- **Programming:** Python, C, MATLAB, Java.
- **Hardware:** MCU (STM32 Arduino), FPGA (Xilinx), PCB design.
- **Platform and Tools:** PyTorch, Android Studio, Linux Kernel, Software-defined Radio, Latex, HFSS

TEACHING EXPERIENCE

CSE891: AIoT-Artificial Intelligence in the Edge, Michigan State University, USA
Guest Lecturer Fall 2023
CSE891: AIoT-Artificial Intelligence in the Edge, Michigan State University, USA
Teaching Assistant Fall 2022
CSE220: Programming in C, Michigan State University, USA
Teaching Assistant Spring 2022, Spring 2023

PROFESSIONAL SERVICE

- **Program Committee:** ACM MobiCom 2024 Artifact Evaluation Program Committee
- **Reviewer:**
  2024: ACM TOSN
  2023: INFOCOM | IEEE/ACM TON | ACM TOSN | IEEE MASS
  2022: ACM TOSN | IEEE MSN| EAI MobiQuitous
  2021: IEEE DySpan | IEEE/ACM CHASE

* denotes authors contributed equally