

WENJIE LUO

Ph.D Candidate

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Research Interests

My research interests lie in improving the performance/efficiency of artificial intelligence (AI) powered Internet of things (IoT) systems. Specifically, I exploit the first principles, together with state-of-the-art machine learning algorithms to address the challenges of data scarcity, label scarcity or the domain shifts in AIoT sensing.

Education

- 2019 Aug – 2023 July (expected) **Ph.D, School of Computer Science and Engineering, Nanyang Technological University (NTU)**, Singapore.
PhD program working title: Exploiting sensor and process characteristics to tackle label scarcity in AIoT sensing.
- 2011 Aug – 2015 June **Bachelor of Engineering, School of Electrical and Electronic Engineering, Nanyang Technological University (NTU)**, Singapore.
- 2010 Aug – 2010 Dec **Bachelor of Engineering, Aeronautics and Astronautics**, Xi'an JiaoTong University (XJTU), China.
I spent unforgettable four months at XJTU after Gaokao in 2010. I was then awarded Senior Middle School Scholarship by the Ministry of Education of Singapore and started my study in NTU.

Publications

In Conference Proceedings

1. PhyAug: Physics-directed data augmentation for deep sensing model transfer in cyber-physical systems.
Wenjie Luo, Zhenyu Yan, Qun Song, Rui Tan.
[ACM/IEEE IPSN'21], *The 20th ACM/IEEE International Conference on Information Processing in Sensor Networks (IPSN)*, May 18 - 21, 2021, Nashville, TN, USA
(Acceptance ratio: 26/105=24.8%). **Best Artifacts Award Runner-up**
2. ILLOC: In-Hall Localization with Standard LoRaWAN Uplink Frames.
Dongfang Guo, Chaojie Gu, Linshan Jiang, **Wenjie Luo**, Rui Tan.
[ACM UbiComp'22], *ACM International Joint Conference on Pervasive and Ubiquitous Computing (UbiComp)*, September 11 — 15, Atlanta, USA and Cambridge, UK
3. Sardino: Ultra-fast dynamic ensemble for secure visual sensing at mobile edge.
Qun Song, Zhenyu Yan, **Wenjie Luo**, Rui Tan.
[EWSN'22], *The 19th International Conference on Embedded Wireless Systems and Networks (EWSN)*, October 3 - 5, Linz, Austria
(Acceptance ratio: 14/46=30%)
4. Indoor Smartphone SLAM with Learned Echoic Location Features.
Wenjie Luo, Qun Song, Zhenyu Yan, Rui Tan.
[ACM Sensys'22], *The 20th ACM Conference on Embedded Networked Sensor Systems*

(Acceptance ratio: 52/209=24.9%)

5. Physics-informed Machine Learning Model Generalization in AIoT: Opportunities and Challenge.
Wenjie Luo and Rui Tan.

[DI-CPS'23], *The 3rd Workshop on Data-Driven and Intelligent Cyber-Physical Systems for Smart Cities (DI-CPS)*, San Antonio, Texas USA, May 9, 2023

Journal Papers

1. Physics-directed data augmentation for deep model transfer to specific sensor.

Wenjie Luo, Zhenyu Yan, Qun Song, Rui Tan.

[ACM TOSN], *ACM Transactions on Sensor Networks (TOSN)*

Demo

1. Demo Abstract: Infrastructure-Free Smartphone Indoor Localization Using Room Acoustic Responses.

Wenjie Luo, Dongfang Guo, Chaojie Gu, Yuting Wu, Qun Song, Zhenyu Yan, Rui Tan.

[ACM Sensys'21], *The 19th ACM Conference on Embedded Networked Sensor Systems (SenSys)*, November 15-17, 2021, Coimbra, Portugal

Paper Under Review

1. Indoor Smartphone SLAM with Acoustic Echoes.

Wenjie Luo, Qun Song, Zhenyu Yan, Rui Tan.

[IEEE TMC], *IEEE Transactions on Mobile Computing*

Ongoing Research Work

1. Addressing data scarcity and missing classes in AIoT applications.
Lead authors: Wenjie Luo.

Work Experience

Micron Semiconductor Pte. Ltd, Singapore

2018 – 2019 **Senior Engineer – Fab10 Yield Enhancement (YE).**

- Identifying Fab process failure root causes and failing mechanisms via data analysis
- Mentoring yield enhancement technicians for daily yield analysis operation

2015 – 2018 **Product Engineer – Non-Volatile Memory.**

- Developing automation scripts to facilitate daily work flows, e.g, data log processing and data visualization
- Developing new validation sequences for Micron 3D NAND products
- Delivering Micron 3D NAND product verification checkouts
- Resolving Micron 3D NAND product issues
- Developing customer requested test flows

Jan – May **Internship – Citibank N.A., Singapore.**

- 2014
- Implementing VBA Macros to elevate shareholding and beneficiary reports generation efficiency
 - Managing the overall incoming swift messages/instruction and assigning them to corresponding clients
 - Developing scripts in assisting coupons and meetings input

Innovations

1. UltraMTD: Resilient Mobile Vision via Ultra-Fast Dynamic Ensemble
[NTU Technical Disclosure] Rui Tan, Qun Song, Zhenyu Yan, **Wenjie Luo**.
2. EchoLoc: Infrastructure-Free Smartphone Indoor Localization Using Room Acoustic Responses
[NTU Technical Disclosure] Rui Tan, Dongfang Guo, **Wenjie Luo**.

Awards

- 2021 Best Artifact Runner-up. The 20th ACM/IEEE International Conference on Information Processing in Sensor Networks (IPSN)
- 2015 Merit award in recognition of outstanding contribution to the University | sports category
- 2011 Senior Middle School Scholarship | Singapore Ministry of Education

Teaching

AI6128: Urban Computing
Tutorial, Nanyang Technological University, 2021, 2022
CE3002: Sensors, Interfacing and Control
Tutor, Nanyang Technological University, 2021
CE3004: Multidisciplinary Design Project
Tutor, Nanyang Technological University, 2021
CZ4032: Data Analytics and Mining
Tutor, Nanyang Technological University, 2020
CE2003: Digital Systems Design
Tutor, Nanyang Technological University, 2020

Professional Services

(Co)-reviewer

IEEE/ACM Transactions on Networking (TON)
IEEE International Conference on Computer Communications (INFOCOM)
IEEE Transactions on Mobile Computing (TMC)
IEEE Transactions on Sensor Network (TOSN)