

CAREER OBJECTIVE

Aspiring to be a leading researcher in **AI-driven Mobile and Edge Computing**, with the goal of making a positive impact on society.

WORK EXPERIENCE

Southern University of Science and Technology Shenzhen, China
Assistant Professor in Computer Science 2023–Current
– Directing the WiSX Lab.

EDUCATION

Nanyang Technological University Singapore
Ph.D. in Computer Science, cGPA:4.60, Advisor: Prof. Jun Luo 2019–2023
– Courses: computational intelligence, deep learning for data science, digital communication systems, convex optimization, image analysis & pattern recognition

University of Toronto Toronto, Canada
M.Eng. in Electrical and Computer Engineering, A+ 2017–2019
– Courses: computer security, CUDA programming, algorithms and data structure, cloud computing, data science and analytics, machine learning, big data science

Harbin Institute of Technology Harbin, China
B.Eng. in Telecommunication Engineering, Grade: 90.18 (Top 3%) 2013–2017
– Courses: calculus, linear algebra, probability theory, signals and systems, electronic circuit, embedded system, computer networks, electromagnetics, antenna design, FPGA design

EXPERIENCE

Facebook Reality Labs Burlingame, United States
Research Scientist at BioXR Aug 2022 –Nov 2022
– Development of next-generation wrist-mounted user input device enabled by edge AI.

Nanyang Technological University Singapore
Graduate Student Researcher at Computer Networks and Communication Lab (CNCL) 2019–Current
– Research into AI-driven mobile and edge computing.

University of Toronto Toronto, Canada
Developer at Communications & Advanced Electronics Lab Summer 2018
– Android App development for digital signal processing.

Sungkyunkwan University Suwon, South Korea
Undergraduate Researcher at Communication & Coding Theory Lab (CCL) Summer 2016
– Coding and decoding of polar and LDPC code.

PROJECTS (WITH RESEARCH OUTPUTS)

- Vital Sign Monitoring via Compact RF Sensing** 2 *MobiCom*, 2 *SenSys*, 1 *UbiComp*, 1 *INFOCOM*
- Design, implement, and deploy large-scale digital health systems that monitor human vital signs, e.g., respiration, heartbeat, interbeat interval, and fine-grained waveforms.
- Autonomous Driving via Multimodal Federated Learning** 1 *MobiCom*
- Design a heterogeneity-aware autonomous driving system enabled by edge computing on connected vehicles.
- Wireless Sensing Platform Development** 1 *MobiCom*, 1 *TMC*, 1 *CommMag*
- Design a general-purpose, energy-efficient platform platform that enables sensing on edge devices.
- RF-based Human Activity Recognition using Deep Learning** 1 *SenSys*, 1 *TMC*
- Design and implement lightweight sensing algorithms to facilitate human activity recognition on edge devices.
- Integrated Sensing and Communication** 2 *MobiCom*, 1 *CommMag*, 1 *JSAC*
- Design and implement hardware and software for ISAC systems based on Wi-Fi and visible light.
- RF Imaging Algorithm Development** 2 *MobiCom*
- Design and implement imaging algorithms for targets in different medium (e.g., air and wall).
- Contact-free Sensing for Human-Computer Interaction** 1 *ICCV*, 1 *INFOCOM*
- Design a system using MIMO radar to perform hand skeleton recovery.
 - Design a system using a smartphone-watch pair to perform real-time wrist tracking.

PUBLICATIONS

(* denotes co-first author.)

1. Jingyang Hu, Hongbo Wang, **Tianyue Zheng**, Jingzhi Hu, Zhe Chen, and Jun Luo, “Password-Stealing without Hacking: Wi-Fi Enabled Practical Keystroke Eavesdropping”, in *Proc. of the 30th ACM CCS*, 2023, pp. 1–14.
2. Jingzhi Hu, Zhe Chen, **Tianyue Zheng**, Robert Schober, and Jun Luo, “HoloFed: Environment-Adaptive Positioning via Multi-band Reconfigurable Holographic Surfaces and Federated Learning”, *IEEE Journal on Selected Areas in Communications*, 2023, pp. 1–32.
3. Jingzhi Hu*, **Tianyue Zheng***, Zhe Chen, Hongbo Wang, and Jun Luo, “MUSE-Fi: Contactless MUperson SENSing Exploiting Near-field Wi-Fi Channel Variation”, in *Proc. of the 29th ACM MobiCom*, 2023, pp. 1–14.
4. Shujie Zhang*, **Tianyue Zheng***, Zhe Chen, Jingzhi Hu, Abdelwahed Khamis, Jiajun Liu, and Jun Luo, “OCHID-Fi: Occlusion-Robust Hand Pose Estimation in 3D via RF-Vision”, in *Proc. of the IEEE/CVF ICCV*, 2023, pp. 1–10.
5. **Tianyue Zheng**, Ang Li, Zhe Chen, Hongbo Wang, and Jun Luo, “AutoFed: Heterogeneity-Aware Federated Multimodal Learning for Robust Autonomous Driving”, in *Proc. of the 29th ACM MobiCom*, 2023, pp. 1–14.
6. Zhe Chen, **Tianyue Zheng**, Chao Cai, and Jun Luo, “Wider is Better? Contact-free Vibration Sensing via Different COTS-RF Technologies”, in *Proc. of the 42nd IEEE INFOCOM*, 2023, pp. 1–10.

7. Zhe Chen, **Tianyue Zheng**, Chao Hu, Hangcheng Cao, Yanbing Yang, Hongbo Jiang, and Jun Luo, “ISACoT: Integrating Sensing with Data Traffic for Ubiquitous IoT Devices”, *IEEE Communications Magazine*, pp. 1–7, 2022. <https://ieeexplore.ieee.org/abstract/document/9941045>
8. Shujie Zhang*, **Tianyue Zheng***, Hongbo Wang, Zhe Chen, and Jun Luo, “Quantifying the Physical Separability of RF-based Multi-Person Respiration Monitoring via SINR”, in *Proc. of the 20th ACM SenSys*, 2022, pp. 1–14.
9. Hangcheng Cao, Daibo Liu, Hongbo Jiang, Chao Cai, **Tianyue Zheng**, John C. S. Lui, and Jun Luo, “HandKey: Knocking-triggered Robust Vibration Signature for Keyless Unlocking”, *IEEE Transactions on Mobile Computing*, 2022, pp. 1–14. <https://ieeexplore.ieee.org/document/9928389/>
10. Zhe Chen, **Tianyue Zheng**, Chao Hu, Hangcheng Cao, Yanbing Yang, Hongbo Jiang, and Jun Luo, “Integrating Monostatic Sensing with Communication for IoT”, in *Proc. of the 1st ACM MobiCom Workshop on Integrated Sensing and Communications Systems*, 2022, pp. 43–48. <https://dl.acm.org/doi/abs/10.1145/3556562.3558571>
11. Ziwei Liu*, **Tianyue Zheng***, Chao Hu, Yanbing Yang, Yimiao Sun, Yi Zhang, Zhe Chen, Liangyin Chen, and Jun Luo, “CORE-Lens: Simultaneous Communication and Object REcognition with Disentangled-GAN Cameras”, in *Proc. of the 28th ACM MobiCom*, 2022, pp. 172–185. <https://dl.acm.org/doi/abs/10.1145/3495243.3560526>
12. **Tianyue Zheng**, Zhe Chen, Shujie Zhang, and Jun Luo, “Catch Your Breath: Simultaneous RF Tracking and Respiration Monitoring with Radar Pairs”, *IEEE Transactions on Mobile Computing*, 2022, pp. 1–14. <https://ieeexplore.ieee.org/document/9852706/>
13. **Tianyue Zheng**, Chao Cai, Zhe Chen, and Jun Luo, “Sound of Motion: Real-time Wrist Tracking with A Smart Watch-Phone Pair”, in *Proc. of the 41st IEEE INFOCOM*, 2021, pp. 1–10. <https://ieeexplore.ieee.org/document/9796731>
14. Shujie Zhang, **Tianyue Zheng**, Zhe Chen, and Jun Luo, “Can We Obtain Fine-grained Heartbeat Waveform via Contact-free RF-sensing?”, in *Proc. of the 41st IEEE INFOCOM*, 2021, pp. 1–10. <https://ieeexplore.ieee.org/document/9796905>
15. **Tianyue Zheng**, Zhe Chen, Shujie Zhang, Chao Cai, and Jun Luo, “MoRe-Fi: Motion-robust and Fine-grained Respiration Monitoring via Deep-Learning UWB Radar”, in *Proc. of the 19th ACM SenSys*, 2021, pp. 1–14, <https://dl.acm.org/doi/abs/10.1145/3485730.3485932>
16. **Tianyue Zheng**, Zhe Chen, Jun Luo, Lin Ke, Chaoyang Zhao, and Yaowen Yang, “SiWa: See into Walls via Deep UWB Radar”, in *Proc. of the 27th ACM MobiCom*, 2021, pp. 323–336, <https://dl.acm.org/doi/10.1145/3447993.3483258>.
17. Zhe Chen*, **Tianyue Zheng***, and Jun Luo, “Octopus: A Practical and Versatile Wideband MIMO Sensing Platform”, in *Proc. of the 27th ACM MobiCom*, 2021, pp. 601–614, <https://dl.acm.org/doi/pdf/10.1145/3447993.3483267>.
18. Zhe Chen*, **Tianyue Zheng***, Chao Cai, and Jun Luo, “MoVi-Fi: Motion-robust Vital Signs Waveform Recovery via Deep Interpreted RF Sensing”, in *Proc. of the 27th ACM MobiCom*, 2021, pp. 392–405, <https://dl.acm.org/doi/pdf/10.1145/3447993.3483251>.
19. Zhe Chen, Chao Cai, **Tianyue Zheng**, Jun Luo, Jie Xiong, and Xin Wang, “RF-Based Human Activity Recognition Using Signal Adapted Convolutional Neural Network”, *IEEE Transactions on Mobile Computing*, pp. 487–499, 2023, <https://ieeexplore.ieee.org/document/9408395>.

20. Shuya Ding, Zhe Chen, **Tianyue Zheng**, and Jun Luo, “RF-Net: a Unified Meta-Learning Framework for RF-Enabled One-Shot Human Activity Recognition”, in *Proc. of the 18th ACM SenSys*, pp. 517–530, <https://dl.acm.org/doi/10.1145/3384419.3430735>, 2020.
21. **Tianyue Zheng**, Zhe Chen, Shuya Ding, and Jun Luo, “Enhancing RF Sensing with Deep Learning: A Layered Approach”, *IEEE Communications Magazine*, vol. 59, no. 2, pp. 70–76, 2021, <https://ieeexplore.ieee.org/document/9374635>.
22. **Tianyue Zheng**, Zhe Chen, Chao Cai, Jun Luo, and Xu Zhang, “V²iFi: in-Vehicle Vital Sign Monitoring via Compact RF Sensing”, in *Proc. of the 20th ACM UbiComp*, 2020, 70:1–27, <https://dl.acm.org/doi/abs/10.1145/3397321>.
23. **Tianyue Zheng**, Zhe Chen, Shuya Ding, Chao Cai, and Jun Luo, “Adv-4-Adv: Thwarting Changing Adversarial Perturbations via Adversarial Domain Adaptation”, arXiv preprint arXiv:2112.00428. <https://arxiv.org/abs/2112.00428>

TALK

1. “Algorithmic Sensing for Energy-Efficient Green Edge Computing”, NRF FRC Green Computing Study Green Edge Workshop.

PATENTS

1. Jun Luo, **Tianyue Zheng**, Yaowen Yang, and Lin Ke, “SiWa: See into Walls Via Deep UWB Radar”, Singapore Patent Application No. 10202106562P.
2. Yanbing Yang, Ziwei Liu, **Tianyue Zheng**, Chao Hu, Pinpin Zhang, Yihuai Xu, Jifei Zhu, Jun Luo, Yimao Sun, “An Integrated Sensing and Communication Method based on Reflective Optical Camera”, China Patent No. CN115204228A.
3. Zhe Chen, Zhijun Qin, **Tianyue Zheng**, Lin Yang, and Wenxin Huang, “Human Activity Recognition Method and System based on Radio-Frequency and Signal-Adapted Convolutional Neural Network”, China Patent No. CN111652040A.
4. Zhe Chen, Zhijun Qin, **Tianyue Zheng**, Lin Yang, and Wenxin Huang, “In-Vehicle Vital Sign Monitoring System based on Compact Radio-Frequency Sensing”, China Patent No. CN111568396A.

PROFESSIONAL SERVICES

- TPC Member
 - ACM S³ 2022 Workshop 2022
- Reviewer
 - ACM UbiComp 2022, 2023
 - ACM Transactions on Sensor Networks 2022, 2023
 - Cybernetics and Systems 2023
 - ACM Transactions on Internet of Things 2022
 - AAAI Conference on Artificial Intelligence 2022
 - Biomedical Signal Processing and Control 2022
 - IEEE Internet of Things Journal 2021

- AEC Member
- ACM SIGCOMM 2022, 2023

TEACHING

- **Teaching Assistant** at Nanyang Technological University 2019–2021
Computer Networks (CE3005/CZ3006) and Introduction to Computational Thinking (CE/CZ1003)
- **Teaching Assistant** at University of Toronto Spring 2019
Communication Systems (ECE316)

SCHOLARSHIPS AND AWARDS

- ACM MobiSys Rising Star 2023
- Research Scholarship at Nanyang Technological University 2019–2023
- IEEE INFOCOM Student Grant 2022
- University Teaching for Teaching Assistants Certificate 2020
- Second Prize in Innovation and Entrepreneurship Contest at Harbin Institute of Technology Summer 2016
- Honorable Mention in Mathematical Contest in Modeling (MCM) Summer 2015
- Scholarship for Outstanding Students at Harbin Institute of Technology 2013–2017