KE SUN

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Assistant Professor ◇ EECS Department ◇ University of Michigan, Ann Arbor
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RESEARCH INTEREST

Mobile and Ubiquitous Computing Systems, **Human-Computer Interaction**, **Mobile and IoT Cybersecurity**, and **Mobile and IoT Health and Environmental Sensing**.

Specifically, I am interested in designing end-to-end intelligent, cost-effective, deployable, trustworthy and human-centric systems for Mobile, Wearable and IoT systems. Specifically, I focus on i). Enable novel applications; ii). Advance computational sensing techniques; iii). Address system bottlenecks; and iv). Harness innovative sensing modalities for MWIoT ecosystems.

EMPLOYMENT

University of Michigan, Ann Arbor *Jan 2025 - Now*
Assistant Professor

Amazon Lab126, Audio Technology *Jun 2023 - Sep 2023*
Applied Scientist Intern

Amazon Lab126, Audio Technology *Jun 2022 - Sep 2022*
Applied Scientist Intern

Amazon Lab126, Audio Technology *Jun 2021 - Sep 2021*
Applied Scientist Intern

EDUCATION

University of California, San Diego *Sep 2019 - Nov 2024*
Ph.D. in Computer Science Engineering
Advisor: Prof. Xinyu Zhang
Google Ph.D. Fellowship

Nanjing University *Sep 2016 - Jun 2019*
M.S. in Computer Science and Engineering
Advisor: Prof. Wei Wang
Graduate China National Scholarship

Nanjing University of Aeronautics and Astronautics *Sep 2012 - Jun 2016*
B.S. in Computer Science and Engineering
Undergraduate President Award, Undergraduate Achievement Award

SELETED HONORS AND AWARDS

- Google Ph.D. Fellowship 2023
- AI/Tech + Aging Pilot Award, National Institute on Aging (NIA) 2023
- ACM IMWUT (UbiComp) Distinguished Paper Award 2023
- ACM MobiCom Student Travel Grant 2021
- ACM SenSys Best Poster Runner-up 2020
- Qualcomm Fellowship Finalist 2019
- ACM MobiSys Student Travel Grant 2018

- Graduate China National Scholarship (Top 3 out of 200) 2018
- Undergraduate Achievement Award (Top 20 out of 3000) 2016
- Outstanding Undergraduate Award (Top 10 out of 3000) 2016
- Undergraduate President Award (Top 10 out of 3000) 2015

SELECTED PUBLICATION

Conference Papers:

1. Security Attacks on LLM-based Code Completion Tools
   Cheng Wen, **Ke Sun**, Xinyu Zhang, Wei Wang
   AAAI 2025 (Oral), Feb 2025.

2. Magmaw: Modality-Agnostic Adversarial Attacks on Machine Learning-Based Wireless Communication Systems
   Jung-Woo Chang, **Ke Sun**, Nasimeh Heydaribeni, Seira Hidano, Xinyu Zhang, Farinaz Koushanfa
   NDSS 2025, Feb 2024.

3. RFCanvas: Modeling RF Channel by Fusing Visual Priors and Few-shot RF Measurements
   Xingyu Chen, Zihao Feng, **Ke Sun**, Kun Qian, Xinyu Zhang
   ACM SenSys 2024, Nov 2024.

4. Multimodal Daily-life Logging in Free-living Environments Using Non-Visual Egocentric Sensors on a Smartphone
   Ke Sun, Chunyu Xia, Xinyu Zhang, Hao Chen, Charlie Zhang
   ACM IMWUT (UbiComp) 2024, March 2024.

5. StealthyIMU: Extracting Permission-protected Private Information from Smartphone Voice Assistant using Zero-Permission Sensors
   Ke Sun, Chunyu Xia, Songlin Xu, Xinyu Zhang
   NDSS 2023, Feb 2023.

6. VECTOR: Velocity Based Temperature-field Monitoring with Distributed Acoustic Devices
   Haoran Wan, Lei Wang, Ting Zhao, **Ke Sun**, Shuyu Shi, Haipeng Dai, Guihai Chen, Haodong Liu, Wei Wang
   ACM IMWUT (UbiComp) 2022, Sep 2022.

7. LoEar: Push the Range Limit of Acoustic Sensing for Vital Sign Monitoring
   Lei Wang, Wei Li, **Ke Sun**, Fusang Zhang, Tao Gu, Chenren Xu, Daqing Zhang
   ACM IMWUT (UbiComp) 2022, Sep 2022.

8. UltraSE: Single-Channel Speech Enhancement Using Ultrasound
   Ke Sun, Xinyu Zhang
   ACM MobiCom 2021, Oct 2021.

9. ExGSense: Toward Facial Gesture Sensing and Reconstruction with a Sparse Near-Eye Sensor Array
   Chen Chen, **Ke Sun**, Xinyu Zhang
   ACM/IEEE IPSN 2021, May 2021.

10. "Alexa, Stop Spying on Me": Speech Privacy Protection Against Voice Assistants
    Ke Sun, Chen Chen, Xinyu Zhang
    ACM SenSys 2020, Nov 2020.

11. milliEgo: Single-chip mmWave Radar Aided Egomotion Estimation via Deep Sensor Fusion
    Chris Xiaoxuan Lu, Muhamad Risqi U. Saputra, Peijun Zhao, Yasin Almalioglu, Pedro P. B. de Gusmao, Changhao Chen, **Ke Sun**, Niki Trigoni, Andrew Markham
    ACM SenSys 2020, Nov 2020.

12. Dynamic Speed Warping: Similarity-Based One-shot Learning for Device-free Gesture Signals
Xun Wang, **Ke Sun**, Ting Zhao, Wei Wang, Qing Gu
IEEE INFOCOM 2020, Apr 2020.

13. SpiderMon: Towards Using Cell Towers as Illuminating Sources for Keystroke Monitoring
Kang Ling, Yuntang Liu, **Ke Sun**, Wei Wang, Lei Xie, Qing Gu
IEEE INFOCOM 2020, Apr 2020.

14. VSkin: Sensing Touch Gestures on Surfaces of Mobile Devices Using Acoustic Signals
Ke Sun, Ting Zhao, Wei Wang, Lei Xie
ACM MobiCom 2018, Oct 2018.

15. Unlock With Your Heart: Heartbeat-based Authentication on Commercial Mobile Phones
Lei Wang, Kang Huang, **Ke Sun**, Wei Wang, Chen Tian, Lei Xie, Qing Gu
ACM IMWUT (Ubicomp) 2018, Oct 2018.

16. Charging Task Scheduling for Directional Wireless Charger Networks
Haipeng Dai, **Ke Sun**, Alex X. Liu, Lijun Zhang, Jiaqi Zheng and Guihai Chen
ACM ICPP, Aug 2018.

17. Depth Aware Finger Tapping on Virtual Displays
Ke Sun, Wei Wang, Alex X. Liu, Haipeng Dai
ACM MobiSys 2018, Jun 2018.

18. WiTrace: Centimeter-Level Passive Gesture Tracking Using WiFi Signals
Lei Wang, **Ke Sun**, Haipeng Dai, Alex X. Liu, Xiaoyu Wang
IEEE SECON 2018, Jun 2018.

19. Device-free Gesture Tracking Using Acoustic Signals
Wei Wang, Alex X. Liu, **Ke Sun**
ACM MobiCom 2016, Oct 2016. (MIT Technology Review)

Journal Papers:

1. Towards Smartphone-based 3D Hand Pose Reconstruction Using Acoustic Signals
Shiyang Wang, Xingchen Wang, Wenjun Jiang, Chenglin Miao, Qiming Cao, Haoyu Wang, **Ke Sun**, Hongfei Xue, Lu Su
ACM Transactions on Sensor Networks, 2024.

2. SCALAR: Self-Calibrated Acoustic Ranging for Distributed Mobile Devices
Lei Wang, Haoran Wan, Ting Zhao, **Ke Sun**, Shuyu Shi, Haipeng Dai, Guihai Chen, Haodong Liu, Wei Wang
IEEE Transactions on Mobile Computing, 2023.

3. DSW: One-shot Learning Scheme for Device-free Acoustic Gesture Signals
Xun Wang, **Ke Sun**, Ting Zhao, Wei Wang, Qing Gu
IEEE Transactions on Mobile Computing, 2022.

4. Charging Task Scheduling for Directional Wireless Charger Networks
Haipeng Dai, **Ke Sun**, Alex X. Liu, Lijun Zhang, etc.
IEEE Transactions on Mobile Computing, 2020.

5. WiTrace: Centimeter-Level Passive Gesture Tracking Using OFDM Signals
Lei Wang, **Ke Sun**, Haipeng Dai, Wei Wang, Kang Huang, etc.
IEEE Transactions on Mobile Computing, 2019.

Filed U.S. Patents:

1. UltraSound based Localization and Mapping
   Ke Sun, Sai Ravi Teja Pulugurtha, Vamshi Krishna Chillara, Krishna Kamath Koteshwara, Berkant Tacer (Amazon 126 Lab)
2. Monitoring Ambient Temperature and Humidity using Ultrasound Sensing on Smart Speaker
   Ke Sun, Krishna Kamath Koteshwara, Berkant Tacer, Karthik Kumar, Carlos Nakagawa, Sai Ravi Teja Pulugurtha (Amazon 126 Lab)
3. Single-channel Speech Enhancement using Ultrasound
   Xinyu Zhang, **Ke Sun**

PROFESSIONAL SERVICES

Technical Program Committee

- 2025 ACM MobiSys, ACM SenSys

Organizer

- 2023 ML4IoT Workshop@ICLR'23

Shadow Program Committee

- 2022 ACM SenSys

Reviewer

- 2024 ACM IMWUT (UbiComp)
- 2023 IEEE ICASSP, ACM TMC, ACM TOSN
- 2022 IEEE ICASSP, ACM IMWUT (UbiComp), ACM SenSys, IEEE TMC, IEEE TWC
- 2021 ACM TOSN, IEEE TMC, ACM MobileHCI
- 2020 IEEE TMC, ACM IMWUT (UbiComp)

SELETED AWARDS

- 2017 China National College Competition on Internet of Things **Finals First Prize**
  Project: Ultrasound based Sensing Applications for Mobile Devices — Oct 2017
- 2015 ACM-ICPC Asia Regional Contest(Chang Chun Site) **Gold Medal** — Oct 2015