

Yadong Xie

Software Engineering · postdoctoral Researcher

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PERSONAL PROFILE

Gender	Male
Date of Birth	1994/03/07
English Level	CET-6
Supervisor	Prof. Fan Li
Research Interests	Mobile Computing, Mobile Health, Acoustic Sensing
Graduation Date	2022/10

EDUCATION

PhD candidate in Computer Science and Technology

SCHOOL OF COMPUTER, BEIJING INSTITUTE OF TECHNOLOGY

Beijing, China

2016/09 - 2022/10

BS in Network Engineering

SCHOOL OF CYBER SECURITY AND COMPUTER, HEBEI UNIVERSITY

Hebei, China

2012/09 - 2016/07

RESEARCH EXPERIENCE

The research field mainly focuses to mobile computing, and mobile health. The specific research fields include acoustic sensing and identity authentication. The main work is summarized as follows:

- We first propose a drowsy driving detection system based on audio devices embedded in smartphones. We find some unique patterns of Doppler shift caused by three typical drowsy behaviors and design an LSTM networks for the detection of drowsy driving.
- We propose a smoking detection system for drivers, which only uses acoustic sensors on smartphones. We divide the smoking detection into hand movement classification and respiration identification, we combine acoustic signal processing with image classification to detect smoking.
- We turn smart speakers into active sonars and propose a fitness monitoring system. We extract features from the Doppler profile of fitness actions and use deep learning to classify the action. We evaluate the fitness quality to help to improve fitness effect.
- We study and find that the bone-conducted sounds of dental occlusion collected in ears contain unique features of individual bones. We extract features from three aspects: bone structure, occlusal location, and occlusal sound. We design an incremental learning-based method to construct the classifier.

Reviewer for 1) IEEE/ACM Transactions on Networking; 2) IEEE Transactions on Mobile Computing; 3) IEEE Transactions on Vehicular Technology; 4) IEEE Internet of Things Journal; 5) IEEE INFOCOM; 6) IEEE GlobeCom; 7) IEEE ICCCN.

PUBLICATIONS

Published Papers:

1. **Yadong Xie**, Fan Li, Yue Wu, Yu Wang, "User Authentication on Earable Devices Via Bone-Conducted Occlusion Sounds", IEEE Transactions on Dependable and Secure Computing, pp. 1-1, 2023, DOI: 10.1109/TDSC.2023.3335368, early access.
2. **Yadong Xie**, Fan Li, Yu Wang, "FingerSlid: Towards Finger-sliding Continuous Authentication on Smart Devices via Vibration", IEEE Transactions on Mobile Computing, pp. 1-1, 2023, DOI: 10.1109/TMC.2023.3315291, early access.
3. **Yadong Xie**, Fan Li, Yue Wu, Yu Wang, "HearFit⁺: Personalized Fitness Monitoring via Audio Signals on Smart Speakers", IEEE Transactions on Mobile Computing, vol. 22, no. 5, pp. 2756-2770, 2023.
4. **Yadong Xie**, Fan Li, Yue Wu, Song Yang, Yu Wang, "HearSmoking: Smoking Detection in Driving Environment via Acoustic Sensing on Smartphones", IEEE Transactions on Mobile Computing, vol. 21, no. 8, pp. 2847-2860, 2022.
5. **Yadong Xie**, Fan Li, Yue Wu, Huijie Chen, Zhiyuan Zhao, Yu Wang. "TeethPass: Dental Occlusion-based User Authentication via In-ear Acoustic Sensing", in IEEE INFOCOM 2022.

6. **Yadong Xie**, Fan Li, Yue Wu, Yu Wang. “HearFit: Fitness Monitoring on Smart Speakers via Active Acoustic Sensing”, in IEEE INFOCOM 2021.
7. **Yadong Xie**, Fan Li, Yue Wu, Song Yang, Yu Wang, “Real-time Detection for Drowsy Driving via Acoustic Sensing on Smartphones”, IEEE Transactions on Mobile Computing, vol. 20, no. 8, pp. 2671-2685, 2021.
8. **Yadong Xie**, Fan Li, Yue Wu, Song Yang, Yu Wang. “D³-Guard: Acoustic-based Drowsy Driving Detection Using Smartphones”, in IEEE INFOCOM 2019.
9. Yue Wu, Jingao Xu, Danyang Li, **Yadong Xie**, Hao Cao, Fan Li, Zheng Yang. “FlyTracker: Motion Tracking and Obstacle Detection for Drones Using Event Cameras”, in IEEE INFOCOM 2023.
10. Zhiyuan Zhao, Fan Li, **Yadong Xie**, Yu Wang. “WakeUp: Fine-Grained Fatigue Detection Based on Multi-Information Fusion on Smart Speakers”, in IEEE INFOCOM 2023.
11. Zhiyuan Zhao, Fan Li, **Yadong Xie**, Yue Wu, Yu Wang, “BSMonitor: Noise-Resistant Bowel Sound Monitoring Via Earphones”, IEEE Transactions on Mobile Computing, pp. 1-1, 2023, DOI: 10.1109/TMC.2023.3270926, early access.
12. Yue Wu, Fan Li, **Yadong Xie**, Yu Wang, Zheng Yang, “SymListener: Detecting Respiratory Symptoms via Acoustic Sensing in Driving Environments”, ACM Transactions on Sensor Networks, vol. 19, no. 1, pp. 1-21, 2023.
13. Yusen Wang, Fan Li, **Yadong Xie**, Chunhui Duan, Yu Wang, “HearASL: Your Smartphone Can Hear American Sign Language”, IEEE Internet of Things Journal, vol. 10, no. 10, pp. 8839-8852, 2023.
14. Yue Wu, Fan Li, **Yadong Xie**, Song Yang, Yu Wang, “HDSpeed: Hybrid Detection of Vehicle Speed via Acoustic Sensing on Smartphones”, IEEE Transactions on Mobile Computing, vol. 21, no. 8, pp. 2833-2846, 2022.
15. Zhixiang Wei, Song Yang, **Yadong Xie**, Fan Li, Bo Zhao, “SVSV: Online Handwritten Signature Verification Based on Sound and Vibration”, Information Science, vol. 572, pp. 109-125, 2021.
16. Xiaoyang Wang, Fan Li, **Yadong Xie**, Song Yang, Yu Wang, “GRi-Fi: Gait and Respiration Based User Identification Using Wi-Fi Signal”, IEEE Internet of Things Journal, vol. 9, no. 5, pp. 3509-3521, 2021.
17. Yue Wu, Fan Li, Liran Ma, **Yadong Xie**, Ting Li, Yu Wang, “A Context-Aware Multiarmed Bandit Incentive Mechanism for Mobile Crowd Sensing Systems”, IEEE Internet of Things Journal, vol. 6, no. 5, pp. 7648-7658, 2019.

Patents:

1. Fan Li, **Yadong Xie**, Yue Wu, Song Yang, “A Method for Fitness Monitoring Using Smart Speakers”, China, 202110323719.9, 2022/5/30.
2. Fan Li, **Yadong Xie**, Lemeng Fu, Yue Wu, “A Method for Smoking Detection in Driving Environment Using Smartphones”, China, 202110323882.5, 2022/3/4.
3. Fan Li, **Yadong Xie**, Yue Wu, Song Yang, “A Method for Drowsy Driving Detection Using Speakers and Microphones of Smartphones”, China, 201910256804.0, 2020/6/16.
4. Fan Li, **Yadong Xie**, Yue Wu, Kerui Zhang, “A User Authentication Method Using Inward-microphones of Earphones”, submitted.
5. Fan Li, **Yadong Xie**, “A Continuous Authentication Method Based on Sliding Vibration Signal”, submitted.
6. Fan Li, Yue Wu, **Yadong Xie**, Song Yang, “A Method for Vehicle Speed Detection Based on Smartphone Acoustic Sensing”, submitted.
7. Fan Li, Zhiyuan Zhao, **Yadong Xie**, Kerui Zhang, Huanran Xie, “A Fine-grained Fatigue detection Method Based on Smart Speakers”, submitted.
8. Fan Li, Zhiyuan Zhao, **Yadong Xie**, Yue Wu, Huanran Xie, Kerui Zhang, “A Method for Monitoring Bowel Sounds Using Earphones”, submitted.

AWARDS

- 2022, IEEE INFOCOM-2022 Student Grant Award
- 2021, National Scholarship
- 2021, IEEE INFOCOM-2021 Student Grant Award
- 2020, BIT Special Scholarship
- 2019, BIT First Class Scholarship

- 2018, BIT First Class Scholarship

FUNDS

- **Participant**, “Research on Key Technologies for Smart Sensing in Safe Driving”, National Natural Science Foundation of China, Grant No. 62072040, 2021/01-2024/12.
- **Participant**, “Research on Key Techniques for High Quality Data Guarantee in Crowd Sensing System”, National Natural Science Foundation of China, Grant No. 61772077, 2018/01-2021/12.

SKILLS

- Programming: Python, Matlab, Android, Java, C/C++
- Multimedia processing: Latex, Office, Visio, Adobe PS, Adobe AI, Adobe AU, Adobe Pr
- Leading ability: I once mentored some junior master and PhD students carrying on some research and writing scientific papers.