

ZI WANG

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Augusta University, 1120 15th Street, Augusta, GA 30912

RESEARCH INTERESTS

My research program addresses three interconnected challenges in cybersecurity through physical and behavioral sensing:

- **Direction 1: Novel Biometric Authentication for the Wearable AI Era.** Pioneering acoustic, biomechanical, and physiological biometrics (toothprints, ear canal deformation, lip articulation dynamics) for continuous, implicit authentication on head-worn wearable devices.
- **Direction 2: Cybersecurity Against Deepfake and Generative AI Threats.** Developing physical-layer and behavioral defenses that verify what is real through signals generative AI cannot replicate, including liveness detection via lip dynamics and RF-based presence verification.
- **Direction 3: Privacy-Preserving Wireless Sensing for Health and Smart Environments.** Building RF and acoustic sensing systems (WiFi, UWB radar) that extract behavioral and environmental information without cameras, providing privacy-preserving infrastructure for security and health monitoring.

EDUCATION AND EMPLOYMENT

Augusta University <i>School of Computer and Cyber Sciences</i> <i>Assistant Professor</i>	2022 – Present
Florida State University, Ph.D. <i>Computer Science</i> <i>Advisor: Prof. Jie Yang</i>	2016 – 2022
Beijing Jiaotong University, M.S. <i>Information System of Traffic Security</i> <i>Advisor: Prof. Yanhui Wang</i>	2011 – 2014
Beijing Jiaotong University, B.E. <i>Information System of eCommerce</i>	2006 – 2010

RESEARCH EXPERIENCE

Augusta University <i>Assistant Professor, School of Computer and Cyber Sciences</i>	2022 – Present
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- Developed DynamicLip, a shape-independent continuous authentication system using lip articulator dynamics, published in IEEE TMC (IF: 9.2)
- Led EarSlide project on secure ear wearable biometric authentication via acoustic fingerprint (UbiComp 2024)
- Investigating audio-visual deepfake vulnerability assessment, leveraging physical-layer liveness signals that generative AI cannot replicate
- Built UWB-PostureGuard, a privacy-preserving RF sensing system for ergonomic posture monitoring (HICSS-59, 2026)
- Co-PI on brain health monitoring combining EEG/fMRI data analysis with AI (NSF SCC-IRG proposal)
- Supervising 3 Ph.D. students and 10 undergraduate researchers across cybersecurity and sensing projects

Florida State University, Pervasive Computing and Cybersecurity Lab <i>Research Assistant</i>	2016 – 2022
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- Ear wearable authentication: acoustic toothprint and ear canal deformation biometrics
- Multi-user tracking and activity recognition using commodity WiFi

Beijing Jiaotong University <i>Research Assistant</i>	2010 – 2014
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PUBLICATIONS

* Corresponding author

1. Huashan Chen, Yifan Xu, Yue Feng, Ming Jian, Feng Liu, Pengfei Hu, Kebin Peng, Sen He, **Zi Wang***, “DynamicLip: Shape-Independent Continuous Authentication via Lip Articulator Dynamics”, *IEEE Transactions on Mobile Computing (IEEE TMC, IF: 9.2)*, 2025.
2. Kebin Peng, Haotang Li, Zhenyu Qi, Huashan Chen, **Zi Wang**, Wei Zhang, Sen He, “LAA-Net: A Physical-prior-knowledge Based Network for Robust Nighttime Depth Estimation”, *Conference on Computer Vision and Pattern Recognition (CVPR 2026)*, 2026. (Under Review)
3. Haotang Li, Zhenyu Qi, Sen He, Kebin Peng, Sheng Tan, Yili Ren, Tomas Cerny, Jiyue Zhao, **Zi Wang***, “UWB-PostureGuard: A Privacy-Preserving RF Sensing System for Continuous Ergonomic Sitting Posture Monitoring”, *The Hawaii International Conference on System Sciences (HICSS-59)*, January 2026.
4. Jiyue Zhao, Shiwei Fang, Sheng Tan, Sen He, **Zi Wang***, “Geospatial Analysis of Wildfire Impact and Predictive Modeling of Susceptibility: A Case Study of Maui, Hawaii and California”, *The Hawaii International Conference on System Sciences (HICSS-59)*, January 2026.
5. Jiyue Zhao, **Zi Wang***, “A Multi-Temporal LiDAR-Derived Geospatial Dataset for Coastal Hazard Assessment”, *BUILDSYS '25: Proceedings of the 12th ACM International Conference on Systems for Energy-Efficient Buildings, Cities, and Transportation (BUILDSYS '25)*, November 2025.
6. Youngone Lee, Sheng Tan, **Zi Wang***, “CochlearMotion: Head Gesture Recognition Leveraging Ear Canal Deformation Sensing”, *The Hawaii International Conference on System Sciences (HICSS-58)*, January 2025.
7. **Zi Wang**, Yilin Wang, Jie Yang, “EarSlide: a Secure Ear Wearables Biometric Authentication Based on Acoustic Fingerprint”, *Proceedings of the ACM on Interactive, Mobile, Wearable, and Ubiquitous Computing (UbiComp 2024)*, 2024. [top-tier.csranks.org conference](https://top-tier.csranks.org/conference).
8. Yilin Wang, **Zi Wang***, Jie Yang, “Acoustic-based Alphanumeric Input Interface for Earables”, *International Conference on Computer Communications and Networks (ICCCN 2024)*, 2024.
9. **Zi Wang**, Yili Ren, Yingying Chen, Jie Yang, “ToothSonic: Earable Authentication via Acoustic Toothprint”, *Proceedings of the ACM on Interactive, Mobile, Wearable, and Ubiquitous Computing (UbiComp 2022)*, September 2022. [top-tier.csranks.org conference](https://top-tier.csranks.org/conference).
10. Yili Ren, **Zi Wang**, Yichao Wang, Sheng Tan, Yingying Chen, Jie Yang, “GoPose: 3D Human Pose Estimation Using WiFi”, *Proceedings of the ACM on Interactive, Mobile, Wearable and Ubiquitous Technologies (UbiComp 2022)*, September 2022. [top-tier.csranks.org conference](https://top-tier.csranks.org/conference).
11. **Zi Wang**, Sheng Tan, Linghan Zhang, Yili Ren, Zhi Wang, Jie Yang, “EarDynamic: An Ear Canal Deformation Based Continuous User Authentication Using In-Ear Wearables”, *Proceedings of the ACM on Interactive, Mobile, Wearable, and Ubiquitous Computing (UbiComp 2021, Acceptance Rate ~20%)*, December 2021. [top-tier.csranks.org conference](https://top-tier.csranks.org/conference).
12. Yili Ren, **Zi Wang**, Sheng Tan, Yingying Chen, Jie Yang, “Winect: 3D Human Pose Tracking for Free-form Activity Using Commodity WiFi”, *Proceedings of the ACM on Interactive, Mobile, Wearable and Ubiquitous Technologies (UbiComp 2021)*, December 2021. [top-tier.csranks.org conference](https://top-tier.csranks.org/conference).
13. Linghan Zhang, Sheng Tan, **Zi Wang**, Yili Ren, Zhi Wang, Jie Yang, “VibLive: A Continuous Liveness Detection for Secure Voice User Interface in IoT Environment”, *36th Annual Computer Security Applications Conference (ACSAC 2020, Acceptance Rate 23.41%)*, December 2020.
14. Yili Ren, Sheng Tan, Linghan Zhang, **Zi Wang**, Zhi Wang, Jie Yang, “Liquid Level Sensing Using Commodity WiFi in a Smart Home Environment”, *Proceedings of the ACM on Interactive, Mobile, Wearable and Ubiquitous Technologies (UbiComp 2020)*, September 2020. [top-tier.csranks.org conference](https://top-tier.csranks.org/conference).
15. **Zi Wang**, Linghan Zhang, Sheng Tan, Jie Yang, “ObstacleWatch: Acoustic-based Obstacle Collision Detection for Pedestrian Using Smartphone”, *Proceedings of the ACM on Interactive, Mobile, Wearable, and Ubiquitous Computing (UbiComp 2019, Acceptance Rate ~20%)*, 2019. [top-tier.csranks.org conference](https://top-tier.csranks.org/conference).
16. Sheng Tan, Linghan Zhang, **Zi Wang**, Jie Yang, “MultiTrack: Multi-User Tracking and Activity Recognition Using Commodity WiFi”, *ACM Conference on Human Factors in Computing Systems (CHI 2019, Acceptance Rate 23.8%)*, Glasgow, 2019. [top-tier.csranks.org conference](https://top-tier.csranks.org/conference).

POSTERS

1. **Zi Wang**, Yili Ren, Yingying Chen, Jie Yang, “Fingerprint-Face Friction Based Earable Authentication”, *ACM Conference on Computer and Communications Security (CCS 2022)* poster, November 2022.
2. **Zi Wang**, Yili Ren, Yingying Chen, Jie Yang, “Earable Authentication via Acoustic Toothprint”, *ACM Conference on Computer and Communications Security (CCS 2021)* poster, 2021.
3. **Zi Wang**, Yili Ren, Yingying Chen, Jie Yang, “An Ear Canal Deformation Based Continuous User Authentication Using Earables”, *The 27th Annual International Conference on Mobile Computing and Networking (MobiCom 2021)* poster, 2021.
4. **Zi Wang**, Yili Ren, Yingying Chen, Jie Yang, “Excerpt of ToothSonic: Earable Authentication via Acoustic Toothprint”, *Adjunct Proceedings of the 2022 ACM International Joint Conference on Pervasive and Ubiquitous Computing and the 2022*

ACM International Symposium on Wearable Computers (UbiComp/ISWC'22 Adjunct) poster, 2022.

5. Y. Ren, Z. Wang, Y. Wang, S. Tan, Y. Chen, J. Yang, "Tracking Free-form Activity Using WiFi Signals", *The 27th Annual International Conference on Mobile Computing and Networking (MobiCom 2021)* poster, 2021.
6. Y. Ren, Z. Wang, Y. Wang, S. Tan, Y. Chen, J. Yang, "3D Human Pose Estimation Using WiFi Signals", *The 19th ACM Conference on Embedded Networked Sensor Systems (SenSys 2021)* poster, 2021.

GRANTS AND FUNDING

Submitted Proposals

- **NSF CRII: SaTC:** "Emerging Head-Channel Biometrics for Secure and User-Friendly Authentication in Head-Worn Wearable Devices" (PI, 2025)
- **NSF SaTC 2.0 RES:** "From Implicit Intent to Non-Repudiable Consent: Bio-Acoustic Trust Gateway for Wearable AI" (PI, 2025)
- **NSF CRII: HCC:** "Enhancing Human-centered Healthcare and Security Leveraging Emerging Sensing of Head-worn Wearables" (PI, 2024)
- **NSF SCC-IRG Track 1:** "A Comprehensive AI-Based Monitoring System for Brain Health and Wellness Across Our Community" (Co-PI, 2024)
- **Sea Grant:** Program Development Proposal (PI, 2025)
- **US Poultry Foundation:** Research Submission (Co-PI, 2025)

In Preparation

- **NIH T32 NINDS:** Institutional AD/ADRD Research Training Program (Program Faculty; PIs: Vale Diaz, Blake)
- **NSF HCC:** "BioFeedback: Real-time EEG-driven Interface Adaptation" (PI; with Dr. Linghan Zhang, TU Eindhoven)
- **NSF CISE:** "BioBot: Learning Human Behavior Patterns Through Wearable Sensing for Embodied AI" (PI; with Dr. Yili Ren, USF)
- **NSF HCC:** "Testing, Mitigating, and Optimizing Tail-latencies in AR, VR, and XR Systems" (PI; with Dr. Sen He, U Arizona)

INVITED TALKS AND CONFERENCE PRESENTATIONS

Invited Talks

- **Invited Speaker**, 3rd International Summit on Robotics, Artificial Intelligence & Machine Learning (ISRAI2026), Frankfurt, Germany, April 20–22, 2026.
- **Invited Talk**, Cyber-Physical Systems Innovation Symposium 2025, Augusta University, 2025.
- **Invited Talk**, Artificial Intelligence in Research and Education (AIRE) Workshop, Augusta University, 2025.
- **Invited Talk**, Healthcare Matters, Medical College of Georgia, Augusta University, 2025.

Conference Presentations

- UWB-PostureGuard and Geospatial Wildfire Analysis, HICSS-59, Big Island, HI, 2026.
- A Multi-Temporal LiDAR-Derived Geospatial Dataset, BuildSys '25, Hangzhou, China, 2025.
- CochlearMotion: Head Gesture Recognition, HICSS-58, Big Island, HI, 2025.
- EarSlide: Secure Ear Wearables Biometric Authentication, UbiComp 2024, Melbourne, Australia, 2024.
- ToothSonic: Earable Authentication via Acoustic Toothprint, UbiComp 2022, Atlanta, GA, 2022.
- EarDynamic: Ear Canal Deformation Based Authentication, UbiComp 2021, Virtual, 2021.
- ObstacleWatch: Acoustic-based Obstacle Collision Detection, UbiComp 2019, London, UK, 2019.

MEDIA COVERAGE

Ear Wearable User Authentication via Acoustic Toothprint: [Unite.AI](#), [ITmedia Japan](#), [Gigazine](#), [ZME Science](#), [Biometric Update](#), [Intertechnews](#), [Livedoor News](#), etc.

Human Pose Estimation: [Tech Explore](#), [The Hack Posts](#), [News8plus](#), [Lifeboat](#)

TEACHING AND MENTORING

CYBR 2600 Networking & Cyber Security

Fall 2025, Spring 2025, Fall 2024, Spring 2023

Instructor of Record, Augusta University

AIST 2220 Introduction to Web Development

Fall 2023

Instructor of Record, Augusta University

AIST 2120 Scripting and Automation

Spring 2024

Instructor of Record, Augusta University

COP 4020 Programming Language

Spring 2018, 2019, 2020, Fall 2020

Teaching Assistant & Guest Lecture, Florida State University

CDA 3100 Computer Organization

Fall 2018, Fall 2019

Teaching Assistant & Guest Lecture, Florida State University

CIS 4403, CIS 4360 Introduction to Computer Security

Fall 2017, Fall 2021

Teaching Assistant & Guest Lecture, Florida State University

CGS 2060 Computer Fluency

Summer 2018

Teaching Assistant, Florida State University

STUDENT ADVISING

Ph.D. Co-Advising

- Arif Hassan Zidan (co-advised with Dr. Wei Zhang), Augusta University
- Salil Verma (co-advised with Dr. Shiwei Fang), Augusta University
- Bojun Zhang (co-advised with Dr. Lin Li), Augusta University

Undergraduate Advising

- Active advisees: 10 undergraduate students
- Thesis advising: Jasmine Mixon (undergraduate thesis)
- Reference letters written: 4

PROFESSIONAL SERVICE

Panels: NSF HCC (Human-Centered Computing), NSF UIST (User Interface Software and Technology)

Committee: DaTaFM'25 at BuildSys 2025 (TPC), AIoTSys25 (TPC), DATA 2024, CANS 2023 (Organizing Committee Co-chair), Electronics (Guest Editor)

Reviewer for conferences: IEEE INFOCOM 2025, UbiComp/IMWUT 2025, UbiComp/IMWUT 2024, CHI 2024, MASS 2023, Interact 2023, InfoCom 2022, InfoCom 2021, ASIACCS 2022, ACSAC 2021, CNS 2021, ESORICS 2021, DCOSS 2021, WiSec 2021, WASA 2021, IWQoS 2021, ICCCN 2021, IoT 2021, IoT 2020, IoT 2019, MSN 2019.

Reviewer for journals: IEEE Internet of Things Journal, IEEE Transactions on Systems, Man, and Cybernetics, IEEE Transactions on Mobile Computing, IEEE Transactions on Dependable and Secure Computing, IEEE Transactions on Information Forensics and Security, Journal of Systems Architecture, Sensors, Electronics, Healthcare, IoT, Applied Sciences, Future Internet, Biomedicines, Signals, Network, IJMS, JFMK.