YOU (NEIL) ZHANG

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EDUCATION

University of Rochester (UR)   **Aug 2019 – Apr 2025 (Expected)**
Ph.D., Electrical and Computer Engineering   *Rochester, NY*

University of Rochester (UR)   **Aug 2019 – May 2021**
M.S., Electrical and Computer Engineering   *Rochester, NY*

University of California, Berkeley (UCB)   **Jan 2018 – Jan 2019**
Undergraduate Exchange Studies, Electrical Engineering and Computer Science   *Berkeley, CA*

University of Electronic Science and Technology of China (UESTC)   **Sep 2015 – Jun 2019**
B.Eng., Automation   *Chengdu, Sichuan, China*

RESEARCH INTERESTS

Speech & Audio Processing, Spatial Audio, Audio-Visual Analysis, Virtual and Augmented Reality, Deep Learning

ACADEMIC & INDUSTRIAL RESEARCH EXPERIENCE

University of Rochester – *Audio Information Research Lab*   **Aug 2019 – Present**
PhD student, Advisor: Prof. Zhiyao Duan   *Rochester, NY*
- **Speaker Verification Anti-Spoofing / Audio Deepfake Detection**
  * Generalization Ability: Proposed **one-class learning** for better detecting unseen spoofing attacks; Mentored a master student working on extending the one-class learning idea with speaker attractor multi-center one-class learning to maintain speaker diversity in real speech
  * Channel Robustness: Hypothesized and verified that channel effect is a primary reason for cross-dataset performance degradation, and proposed training strategies to improve the channel robustness for anti-spoofing; Mentored an undergraduate student working on the effect of phase perturbation to improve robustness to unseen channels
  * Joint Optimization: Proposed a **probabilistic fusion framework** for spoofing aware speaker verification
  * Singing Voice Deepfake Detection: Proposed novel task and identified challenges with collected SingFake dataset.
- **Personalized Head-Related Transfer Function (HRTF) Modeling for Spatial Audio**
  * Proposed learning **neural field representations** for unifying measured HRTFs across existing databases
  * Mentored a student and proposed a novel **position-dependent normalization strategy** that effectively mitigates the influence of cross-database differences to improve the learned representation further
  * Built a deep learning system to predict the **spherical harmonic coefficients** from anthropometric measurements and scanned head geometry of subjects for HRTF personalization
- **Audio-Visual Rendering and Analysis**
  * Emotional Talking Face Generation: Implemented and evaluated a baseline method and took charge of the subjective evaluation section, including the Amazon Mechanical Turk (AMT) setup, survey design, and data analysis
  * Audio-Visual Speaker Diarization: Mentored a student working on audio-visual synchronization and off-screen speakers problem for audio-visual speaker diarization

IngenID – *Voice Biometrics Group*   **Aug 2019 – Present**
Research Associate, CEO: Peter Soufleris   *Rochester, NY*
- **Development and Deployment of Backend Algorithms for Speech Biometrics Analysis**

Meta – *Meta Reality Labs*   **May 2024 – Sep 2024**
Research Intern, Mentor: Dr. Ishwarya Ananthabhotla   *Redmond, WA*

Microsoft – *Applied Sciences*   **May 2023 – Aug 2023**
Research Intern, Mentor: Dr. Kazuhito Koishida   *Redmond, WA*
- **Audio-Visual Segmentation by Prompting Segment Anything Model**

Tencent America – *Tencent AI Lab*   **May 2022 – Aug 2022**
Research Intern, Mentor: Dr. Shi-Xiong Zhang   *Bellevue, WA*
- **Multi-Channel Audio-Visual Speaker Diarization with Spatial Features**

Bytedance / Tiktok – *Speech, Audio & Music Intelligence* **May 2021 – Aug 2021**
Research Intern, Mentor: <u>Dr. Ming Tu</u> *Mountain View, CA*
- **Audio-Visual Active Speaker Detection with Noisy Student Training**

Tencent – *Tencent Media Lab* **Jun 2019 – Aug 2019**
Research Intern, Mentor: <u>Dr. Yannan Wang</u> *Shenzhen, Guangdong, China*
- **Perceptual Loss Design for Mask-based Speech Enhancement**

PUBLICATIONS (* equal contribution, ‡ student mentored)

Book Chapters

[1] **You Zhang**, Fei Jiang, Ge Zhu, Xinhui Chen[‡], and Zhiyao Duan. "Generalizing Voice Presentation Attack Detection to Unseen Synthetic Attacks and Channel Variation", *Handbook of Biometric Anti-spoofing (3rd ed.)*, Springer, 2023. [DOI][code]

Journals

[3] Yuxiang Wang, **You Zhang**, Zhiyao Duan, and Mark Bocko. "Predicting Global Head-Related Transfer Functions From Scanned Head Geometry Using Deep Learning and Compact Representations", *arXiv preprint arXiv:2207.14352*, 2024. (under review) [link][code]

[2] Sefik Emre Eskimez, **You Zhang**, and Zhiyao Duan. "Speech Driven Talking Face Generation from a Single Image and an Emotion Condition", *IEEE Transactions on Multimedia*, vol. 24, pp. 3480-3490, 2021. [DOI][code][project webpage]

[1] **You Zhang**, Fei Jiang, and Zhiyao Duan. "One-class Learning Towards Synthetic Voice Spoofing Detection", *IEEE Signal Processing Letters*, vol. 28, pp. 937-941, 2021. [DOI][code][video][project webpage]

Conferences and Workshops

[12] Yongyi Zang*[‡], **You Zhang***, Mojtaba Heydari, and Zhiyao Duan. "SingFake: Singing Voice Deepfake Detection", in *Proc. IEEE International Conference on Acoustics, Speech and Signal Processing (ICASSP)*, 2024. [DOI][code][project webpage]

[11] Enting Zhou[‡], **You Zhang**, and Zhiyao Duan. "Learning Arousal-Valence Representation from Categorical Emotion Labels of Speech", in *Proc. IEEE International Conference on Acoustics, Speech and Signal Processing (ICASSP)*, 2024. [DOI][code]

[10] Yutong Wen[‡], **You Zhang**, and Zhiyao Duan. "Mitigating Cross-Database Differences for Learning Unified HRTF Representation", in *Proc. IEEE Workshop on Applications of Signal Processing to Audio and Acoustics (WASPAA)*, 2023. [DOI][code][video]

[9] Yongyi Zang[‡], **You Zhang**, and Zhiyao Duan. "Phase Perturbation Improves Channel Robustness for Speech Spoofing Countermeasures", in *Proc. Interspeech*, pp. 3162-3166, 2023. [DOI][code]

[8] Siwen Ding[‡], **You Zhang**, and Zhiyao Duan. "SAMO: Speaker Attractor Multi-Center One-Class Learning for Voice Anti-Spoofing", in *Proc. IEEE International Conference on Acoustics, Speech and Signal Processing (ICASSP)*, 2023. [DOI][code][video]

[7] **You Zhang**, Yuxiang Wang, and Zhiyao Duan. "HRTF Field: Unifying Measured HRTF Magnitude Representation with Neural Fields", in *Proc. IEEE International Conference on Acoustics, Speech and Signal Processing (ICASSP)*, 2023. [DOI][code] [video] (**Recognized as one of the top 3% of all papers accepted at ICASSP 2023**)

[6] Abudukelimu Wuerkaixi[‡], Kunda Yan, **You Zhang**, Zhiyao Duan, and Changshui Zhang. "DyViSE: Dynamic Vision-Guided Speaker Embedding for Audio-Visual Speaker Diarization", in *Proc. IEEE 24th International Workshop on Multimedia Signal Processing (MMSP)*, pp. 1-6, 2022. [DOI][code]

[5] Abudukelimu Wuerkaixi[‡], **You Zhang**, Zhiyao Duan, and Changshui Zhang. "Rethinking Audio-visual Synchronization for Active Speaker Detection", in *Proc. IEEE 32nd International Workshop on Machine Learning for Signal Processing (MLSP)*, 2022. [DOI][code]

[4] **You Zhang**, Ge Zhu, and Zhiyao Duan. "A Probabilistic Fusion Framework for Spoofing Aware Speaker Verification", in *Proc. The Speaker and Language Recognition Workshop (Odyssey)*, pp. 77-84, 2022. [DOI][code]

[3] Xinhui Chen*[‡], **You Zhang***, Ge Zhu*, and Zhiyao Duan. "UR Channel-Robust Synthetic Speech Detection System for ASVspoof 2021", in *Proc. ASVspoof 2021 Workshop*, pp. 75-82, 2021. [DOI][code][video]

[2] **You Zhang**, Ge Zhu, Fei Jiang, and Zhiyao Duan. "An Empirical Study on Channel Effects for Synthetic Voice Spoofing Countermeasure Systems", in *Proc. Interspeech*, pp. 4309-4313, 2021. [DOI][code][video]

[1] Yuxiang Wang, **You Zhang**, Zhiyao Duan, and Mark Bocko. "Global HRTF Personalization Using Anthropometric Measures", in *Audio Engineering Society (AES) 150th Convention*, 2021. [link][code][video]

Conference Abstracts

[3] **You Zhang**, Yuxiang Wang, Mark Bocko, and Zhiyao Duan. "Grid-Agnostic Personalized Head-Related Transfer Function Modeling with Neural Fields", in *Acoustical Society of America (ASA) 184th Meeting*, 2023. [DOI] (**Recognized by Signal Processing at the ASA Student Paper Award - Second Place**)

[2] Samantha E. Lettenberger, Maryam Zafar, Julia M. Soto, **You Zhang**, Ge Zhu, Aaron J. Masino, Grace Nkrumah, Emma Waddell, Kelsey Spear, Abigail Arky, Rajbir Toor, Emily Hartman, Jacob Epifano, Rich Christie, Zhiyao Duan, and Ray Dorsey. "Words Spoken Daily: A Novel Measure of Cognition", in *International Congress of Parkinson's Disease and Movement Disorders (MDS)*, 2023. [DOI]

[1] Yuxiang Wang, **You Zhang**, Zhiyao Duan, and Mark Bocko. "Employing Deep Learning Method to Predict Global Head-Related Transfer Functions from Scanned Head Geometry", in *Acoustical Society of America (ASA) 181st Meeting*, 2021. [DOI]

INVITED TALKS

[5] Audio Deepfake Detection	
Global AI Bootcamp, Ukraine – Online	Mar 2024
[4] Audio Deepfake Detection [video]	
Generative AI Spring School, Ukraine – Online	Mar 2024
[3] Improving Generalization Ability for Audio Deepfake Detection	
Learning And Mining from DatA (LAMDA) Lab, Nanjing University, China	Dec 2023
[2] Generalizing Voice Presentation Attack Detection to Unseen Synthetic Attacks [link]	
ISCA Special Interest Group (SIG) - Security and Privacy in Speech Communication (SPSC) webinar – Online	Feb 2023
[1] One-class Learning Towards Synthetic Voice Spoofing Detection	
National Institute of Informatics (NII), Japan – Online	Jan 2021

TUTORIALS

[2] Multimedia Deepfake Detection	
IEEE International Conference on Multimedia and Expo (ICME), Niagra Falls, Canada	July 2024
[1] Machine Learning for Personalized Head-Related Transfer Functions (HRTFs) Modeling in Gaming	
AES 6th International Conference on Audio for Games, Tokyo, Japan	Apr 2024

TEACHING

Teaching Assistant

• ECE 411	Selected Topics in Augmented and Virtual Reality	Spring 2024
• ECE 277 / 477	Computer Audition	Fall 2020 & Fall 2023
• ECE 208 / 408	The Art of Machine Learning	Spring 2022 & Spring 2023
• ECE 440	Introduction to Random Processes	Fall 2022
• ECE 272 / 472	Audio Signal Processing	Spring 2020 & Spring 2021
• ECE 216	Microprocessor & Data Conversion	Fall 2019

Students Mentored

• Kyungbok Lee	CS undergraduate @ UR	Audio-Visual Deepfake Detection
• Yutong Wen	AME undergraduate @ UR	HRTF Personalization with Neural Fields
• Enting Zhou	CS undergraduate @ UR	Speech Emotion Representation Learning
• Yongyi Zang	AME undergraduate @ UR	Audio Deepfake Detection
• Siwen Ding	DS master @ Columbia University	Audio Deepfake Detection
• Abudukelimu Wuerkaixi	PhD student @ Tsinghua University	Audio-Visual Speaker Diarization
• Xinhui Chen	CS master @ UR	Audio Deepfake Detection

HONORS & AWARDS

• National Institute of Justice (NIJ) Graduate Research Fellowship [link]	Fall 2023 – Spring 2025
• Top 3% of all papers accepted at ICASSP 2023 [link]	Summer 2023
• ICASSP Rising Stars in Signal Processing [link]	Summer 2023
• Signal Processing at the ASA Student Paper Award - Second Place	Spring 2023
• Travel Grant from AS&E Graduate Student Association @ UR	Fall 2021 & Summer 2022
• Travel Grant from NSF-NRT AR/VR Training Program	Spring 2022
• Outstanding Graduate @ UESTC	Spring 2019
• Renmin Scholarship (Top 3%)	Fall 2016 & Fall 2017 & Fall 2018

PROFESSIONAL SERVICES

Leadership

- Executive Committee Member for AR/VR PhD training program   Fall 2023 – Spring 2024
- Western New York AR/VR Mini-Conference Co-chair [link]   Spring 2022 & Spring 2023
- Diversity, Equity, and Inclusion (DEI) Committee Member for ECE Department [link]   Fall 2022 – Spring 2023
- IEEEXtreme 16.0 Ambassador [link]   Fall 2022

Reviewer

- **Journals**:
    * IEEE/ACM Transactions on Audio, Speech, and Language Processing (TASLP)
    * IEEE Open Journal of Signal Processing (OJSP)
    * ACM Transactions on Multimedia Computing, Communications, and Applications (TOMM)
    * EURASIP Journal on Advances in Signal Processing
    * Transactions of the International Society for Music Information Retrieval (TISMIR)
    * IEEE Transactions on Computational Imaging (TCI)
    * Neural Networks
    * IEEE Access

- **Conferences and Workshops**:
    * ICASSP 2024, Interspeech 2023
    * Audio Engineering Society (AES) 152nd, 153rd, 154th, 155th, 156th Convention
    * IJCAI 2023 Workshop on Deepfake Audio Detection and Analysis (DADA 2023)
    * CVPR 2023 6th Multimodal Learning and Applications Workshop (MULA 2023)