Tiantian Feng Ph.D.

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Education

University Of Southern California Los Angeles, USA
Ph.D. in Computer Science 2017 - 2024
- Advisor: University Professor Shrikanth Narayanan
- Research areas: **Human Health, Human Behaviors, Wearables Trustworthy Learning, Speech and Multimodal Learning, Affective Computing**

University Of Southern California Los Angeles, USA
Master's in Electrical Engineering, Wireless Health Technology 2013 - 2015

Nanjing University of Posts and Telecommunications Nanjing, China
Bachelor of Science 2009 - 2013

Ph.D. Thesis

Generative Foundation Model Assisted Privacy-Enhancing Computing in Human-Centered Machine Intelligence
Thesis Committee:
Shrikanth Narayanan, Morteza Dehghani, Kristina Lerman, Aiichiro Nakano

Awards

- **First Prize**, INTERSPEECH - Speech Emotion Challenge Task 2 2025
- **Second Prize**, INTERSPEECH - Speech Emotion Challenge Task 1 2025
- **IEEE EMBC NextGen Scholar Award** 2024
- **Travel Grant** , ICASSP Conference, 2024
- **Best Research Assistant**, CS Department at USC Viterbi School (one per year) 2023
- **Best Paper Award Finalist**, ICASSP Conference 2019
- **Commercialization Award**, Stevens Center, USC 2019
- **GSG Student Travel Grant**, USC 2018, 2019

Academic Service

- **Conference Area Chair**: "Federated and Distributed Learning" ICASSP 2025
- **Conference Session Chair**: "Sensing for Sleep, Stress, and Emotion" EMBC 2024
- **Conference Review** Neurips, ICASSP, EMBC, ICMI, ACII
- **Journal Review** JBHI, TAFFC, JMIR, TKDE, SPL, Computer Speech and Language
- **Workshop and Special Session Organization**
  - INTERSPEECH Responsible Speech Foundation Models 2024, 2025
  - AAAI Symposium on Child-AI Interaction in the Era of Foundation Models 2025
  - ICASSP Trustworthy Speech Processing 2025

Work and Internships

Postdoc, University of Southern California | Los Angeles, USA 2024 - Current
- Lead research effort in human behavior understanding using multimodal data.
- Mentor Ph.D. student and undergraduate student.
- Assist and contribute to the fund and grant application, including NSF, NIH, Amazon, and Capital One.

Research Scientist Intern, Meta Platforms | Seattle, USA 2023.05 - 2023.08
- Design cutting-edge speech modeling approaches for smart glasses applications.

Applied Scientist Intern, Amazon.com, Inc. | Los Angeles, USA 2022.05 - 2022.08
- Conduct research in Federated Learning and Trustworthy Computing.

Electrical Engineer, Pressure Profile Systems, Inc. | Los Angeles, USA 2015 - 2017
- Design Capacitive Tactile sensors, sensor interface, and firmware with customers from Apple, Google, Medtronics, Toyota, Microsoft, etc.
- Lead SingleTact projects: https://www.singletact.com.

Research Projects

SFARI: Multimodal, Objective Assessment of the ASD phenotype: Longitudinal Stability and Change across Contexts
Simons Foundations 2024 - Current

ARTS: Anonymous Real-Time Speech
IARPA 2024 - Current

Multilingualism as a factor of resilience to Alzheimer's disease and related dementias in India
NIH 2024 - Current

Detecting and mapping stress patterns across space and time:
NSF Smart Connected Health 2023 - Current

EDA and Sensor Fusion for Fatigue/Affective State Detection
Toyota Research Institute North America (TRINA) 2023 - 2025

Using Automated Methods to Classify Language Ability in Children with Autism
Apple 2021 - 2024

Evaluating BOSCC and ELSA as Outcome Measures in the Context of a JASPER
Simons Foundation 2021 - 2025

Federated Learning for Human-centered Experience Modeling with Biobehavioral Data
Amazon-USC Research Center 2021 - 2024

Rich and Efficient Media Content Processing
Google 2020 - 2022

TILES: Tracking Individual performance with Sensors.
IARPA (MOSAIC Program) 2017 - 2020

Featured Publications

Dataset Contributions

1. **Feng, Tiantian, et al.** TILES-2018 Sleep Benchmark Dataset: A Longitudinal Wearable Sleep Data Set of Hospital Workers for Modeling and Understanding Sleep Behaviors. *Under review*, 2025.

2. Shi, Xuan*, **Tiantian Feng*, et al.** 75-Speaker Annot-16: A benchmark dataset for speech articulatory rt-MRI annotation with articulator contours and phonetic alignment. *INTERSPEECH*, 2025 (*equal contribution).

3. Zhang, Tuo*, **Tiantian Feng*, et al.** Creating a lens of Chinese culture: A multimodal dataset for Chinese pun rebus art understanding. *ACL*, 2025 (*equal contribution). GitHub: https://github.com/zhang-tuo-pdf/Pun-Rebus-Art-Benchmark.(★ 5 stars)

4. Wang, Helin, Jiarui Hai, Dading Chong, Karan Thakkar, **Tiantian Feng, et al.**. "CapSpeech: Enabling Downstream Applications in Style-Captioned Text-to-Speech." *Under review*, 2025. GitHub: https://github.com/WangHelin1997/CapSpeech.(★ 357 stars)

5. Bose, Digbalay, Rajat Hebbar, **Tiantian Feng**, Krishna Somandepalli, Anfeng Xu, and Shrikanth Narayanan. MM-AU: Towards Multimodal Understanding of Advertisement Videos. *ACM Multimedia*, 2023.

6. Nashiro, K., Min, J., Yoo, H.J., Cho, C., Bachman, S.L., Dutt, S., Thayer, J.F., Lehrer, P.M., **Tiantian Feng, et al.** Increasing coordination and responsivity of emotion-related brain regions with a heart rate variability biofeedback randomized trial. *Cognitive, Affective, & Behavioral Neuroscience*, 2022.

7. Yau, Joanna C., Benjamin Girault, **Tiantian Feng, et al.** TILES-2019: A longitudinal physiologic and behavioral data set of medical residents in an intensive care unit. *Scientific Data*, 2022.

8. Mundnich, Karel, Brandon M. Booth, Michelle l'Hommedieu, **Tiantian Feng, et al.** TILES-2018, a longitudinal physiologic and behavioral data set of hospital workers. *Scientific Data*, 2020.

Benchmark Efforts

1. **Feng, Tiantian, et al.** FedMultimodal: A Benchmark For Multimodal Federated Learning. *KDD*, 2023. GitHub : https://github.com/usc-sail/fed-multimodal.(★ 120 stars)

2. **Feng, Tiantian, et al.** Vox-Profile: A Speech Foundation Model Benchmark for Characterizing Diverse Speaker and Speech Traits. *Under review*, 2025. GitHub : https://github.com/tiantiaf0627/vox-profile-release.(★ 55 stars)

3. **Feng, Tiantian, et al.** Voxlect: A Speech Foundation Model Benchmark for Modeling Dialects and Regional Languages Around the Globe. *Under review*, 2025. GitHub : https://github.com/tiantiaf0627/voxlect.(★ 15 stars)

4. **Feng, Tiantian, et al.** TrustSER: On the trustworthiness of fine-tuning pre-trained speech embeddings for speech emotion recognition. *ICASSP*, 2023. GitHub : https://github.com/usc-sail/trust-ser.(★ 13 stars)

5. Zhang, Tuo*, **Tiantian Feng*, et al.** FedAudio: A federated learning benchmark for audio tasks. *ICASSP*, 2023 (*equal contribution). GitHub : https://github.com/zhang-tuo-pdf/FedAudio.(★ 50 stars)

6. Alam, Samiul, Tuo Zhang, **Tiantian Feng, et al.** FedAIoT: A Federated Learning Benchmark for Artificial Intelligence of Things. *Data-centric Machine Learning Research*, 2024.

Wearable Sensing and Learning

1. **Feng, Tiantian, et al.** Exploring workplace behaviors through speaking patterns using large-scale wearable recordings: A study of healthcare providers. Under Review.

2. **Feng, Tiantian, et al.** TILES Audio Recorder: An unobtrusive wearable solution to track audio activity. *WearSys'18: ACM Workshop on Wearable Systems*, 2018.

3. **Feng, Tiantian, et al.** Egocentric Speaker Classification in Child-Adult Dyadic Interactions: From Sensing to Computational Modeling. *INTERSPEECH*, 2025.

4. **Feng, Tiantian**, Ju Lin, Yiteng Huang, Weipeng He, Kaustubh Kalgaonkar, Niko Moritz, Li Wan, Xin Lei, Ming Sun, and Frank Seide. Directional Source Separation for Robust Speech Recognition on Smart Glasses. *ICASSP*, 2025 (Work Done at Meta).

5. **Feng, Tiantian**, Shrikanth Narayanan. Understanding Stress, Burnout, and Behavioral Patterns in Medical Residents Using Large-scale Longitudinal Wearable Recordings. *EMBC*, 2024.

6. Avramidis, Kleanthis, Dominika Kunc, Bartosz Perz, Kranti Adsul, **Tiantian Feng, et al.**. Scaling Representation Learning from Ubiquitous ECG with State-Space Models. *Journal of Biomedical and Health Informatics*, 2024.

7. **Feng, Tiantian**, Shrikanth Narayanan. Discovering Optimal Variable-length Time Series Motifs in Large-Scale Wearable Recordings of Human Bio-behavioral Signals. *ICASSP*, 2019 (Best paper finalist).

Child-centered Technology

1. **Feng, Tiantian, et al.** Can Generic LLMs Help Analyze Child-Adult Interactions Involving Children with Autism in Clinical Observation? *NeurIPS GenAI for Health Workshop*, 2023.

2. Anfeng Xu, **Tiantian Feng, et al.** Large Language Models based ASR Error Correction for Child Conversations. *INTERSPEECH*, 2025.

3. Kommineni, Aditya, Digbalay Bose, **Tiantian Feng**, So Hyun Kim, Helen Tager-Flusberg, Somer Bishop, Catherine Lord, et al. Towards Child-Inclusive Clinical Video Understanding for Autism Spectrum Disorder. *INTERSPEECH*, 2025.

4. Xu, Anfeng, **Tiantian Feng, et al.** Data Efficient Child-Adult Speaker Diarization with Simulated Conversations. *ICASSP*, 2025.

Multimodal Systems

1. **Feng, Tiantian, et al.** Can Text-to-image Model Assist Multi-modal Learning for Visual Recognition with Visual Modality Missing? *ACM International Conference on Multimodal Interaction*, 2024.
2. **Feng, Tiantian, et al.** A multimodal analysis of physical activity, sleep, and work shift in nurses with wearable sensor data. *Scientific Reports*, 2021.
3. **Feng, Tiantian, et al.** ModalityMirror: Enhancing Audio Classification in Modality Heterogeneity Federated Learning via Multimodal Distillation. *Proceedings of the 35th MM-SYS Workshop*, 2025.
4. Lee, Jihwan, **Tiantian Feng, et al.** Enhancing listened speech decoding from EEG via parallel phoneme sequence prediction. *ICASSP*, 2025.

Trustworthy Computing

1. **Feng, Tiantian, et al.** A review of speech-centric trustworthy machine learning: Privacy, safety, and fairness. *APSIPA Transactions on Signal and Information Processing*, 2023.
2. **Feng, Tiantian, et al.** User-Level Differential Privacy against Attribute Inference Attack of Speech Emotion Recognition in Federated Learning. *INTERSPEECH*, 2022. GitHub : https://github.com/usc-sail/fed-ser-leakage. (★ 14 stars)
3. Zhang, Tuo*, **Tiantian Feng*, et al.** GPT-FL: Generative pre-trained model-assisted federated learning. *CVPR Workshops*, 2025 (*equal contribution).
4. **Feng, Tiantian, et al.** Partial Federated Learning. *ICASSP Workshops*, 2024 (Work Done at Amazon). Featured on: https://www.amazon.science/publications.
5. **Feng, Tiantian, et al.** Enhancing Privacy Through Domain Adaptive Noise Injection For Speech Emotion Recognition. *ICASSP*, 2022.

Affective Computing

1. **Feng, Tiantian, et al.** Developing A Top-tier Framework in Naturalistic Conditions Challenge for Categorized Emotion Prediction: From Speech Foundation Models and Learning Objective to Data Augmentation and Engineering Choices, *INTERSPEECH*, 2025.
2. Thanathai Lertpetchpun*, **Tiantian Feng*, et al.** Developing a High-performance Framework for Speech Emotion Recognition in Naturalistic Conditions Challenge for Emotional Attribute Prediction. *INTERSPEECH*, 2025 (*equal contribution).
3. **Feng, Tiantian**, and Shrikanth Narayanan. Foundation Model Assisted Automatic Speech Emotion Recognition: Transcribing, Annotating, and Augmenting. *ICASSP*, 2024.
4. **Feng, Tiantian**, and Shrikanth Narayanan. PEFT-SER: On the Use of Parameter Efficient Transfer Learning Approaches For Speech Emotion Recognition Using Pre-trained Speech Models. *ACII*, 2023. GitHub : https://github.com/usc-sail/peft-ser.(★ 60 stars)
5. Zhu, Xin, **Feng, Tiantian, et al.** Understanding the effect of speed on human emotion perception in mediated social touch using voice coil actuators. *Frontiers*, 2022.

Skills

Languages: Chinese, English.

Programming: `Python`, `C++`, `MATLAB`, Java.