Anbai Jiang

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WeChat: same as phone Homepage
Scholar (469 citations) GitHub



Education

Tsinghua University | Electronic Engineering 2022 – Present

Ph.D. student, direct-entry program; expected graduation: 2027.
Advisor: Prof. Pingyi Fan (WISTLAB). Co-advisors: Prof. Jia Liu and Prof. Wei-Qiang Zhang (SATLAB).

Tsinghua University | B.S. in Electronic Engineering 2018 – 2022

Research Overview

Universal industrial signal representations: **Unified representations and large-scale pretraining** for multimodal industrial signals (sound, vibration, etc.), focusing on **multiple sampling rates, cross-modal transfer, and generalization to downstream tasks**.

Anomalous sound detection: Detecting anomalies at test time using only normal training data. Research spans representation learning and detection, with a focus on **pretrained model fine-tuning, cross-domain generalization, and generative models for augmentation**.

Experience in speech/audio analysis and pretrained model fine-tuning supports research in speech, audio, and music understanding and generation. Extensive experience with **AI agents and AI infrastructure operations**.

Representative Research

Universal Industrial Signal Representations

Native Multi-Rate Modeling | FISHER (Code / Benchmark; 21 citations) IEEE TII 2026

Pingyi Fan, **Anbai Jiang**, et al. *FISHER: A Foundation Model for Multi-Modal Industrial Signal Comprehensive Representation* (advisor as first author)

- Proposed a novel self-supervised **subband splitting and concatenation** method to natively process signals with different sampling rates.
- Achieved state-of-the-art results on industrial signal benchmarks, validating multi-rate modeling; had been deployed in renewable energy infrastructures.
- Conducted all pretraining, built most of the benchmark, and wrote the vast majority of the manuscript.

Anomalous Sound Detection

Anomaly Detection via Flow Matching | Relative Mismatch Under review, 2026

Anbai Jiang et al. *Relative Mismatch: Local-Reference Calibration of Feature-Space Flows for Anomalous Sound Detection*

- Trained Flow Matching models in feature space and used the trajectory mismatch for anomaly detection.
- Calibrated the intrinsic mismatch bias of rare operating conditions under domain shift using nearby training features as local references.

Adaptive Prototypes for Partially Known Attributes (29 citations) ICASSP 2025

Anbai Jiang et al. *Adaptive Prototype Learning for Anomalous Sound Detection with Partially Known Attributes*

- Used **learnable sub-centers** to adaptively model unlabeled operating-condition classes, improving detection with inconsistent label granularity.

Cooperative Training | CoopASD (2 citations) GLOBECOM 2024

Anbai Jiang et al. *CoopASD: Cooperative Machine Anomalous Sound Detection with Privacy Concerns*

- Extended AnoPatch to cooperative training, demonstrating feasibility and improving performance on fully non-IID data.

Adapting Pretrained Models | AnoPatch (56 citations) INTERSPEECH 2024

Anbai Jiang et al. *AnoPatch: Towards Better Consistency in Machine Anomalous Sound Detection*

- Pioneered successful transfer of pretrained models to anomalous sound detection, substantially outperforming prior state of the art; identified data and architecture consistency as key.
- Won **1st place worldwide in DCASE 2024 Task 2**, helping lead the field toward pretrained models.

Autoencoding with Adversarial Reconstruction | AEGAN-AD (Code; 78 citations) ICASSP 2023

Anbai Jiang et al. *Unsupervised Anomaly Detection and Localization of Machine Audio: A GAN-based Approach*

- Introduced **adversarial training** into an autoencoder to counter its tendency to denoise reconstructions, improving reconstruction-error-based anomaly detection.

Competition Results

DCASE 2024 Task 2 | Machine anomalous sound detection | **1st, 2nd** 2024

ICME 2024 ASC GC | Urban acoustic scene classification | **2nd, 3rd** 2024

DCASE 2023 Task 2 | Machine anomalous sound detection | **2nd, 3rd** 2023

Internships

Huakong AI Plus | Industrial Signal Algorithms and Applications, Beijing Nov. 2023 – Present

- Core contributor for industrial signal processing research and real-world applications.

Tencent CDG | LLM-based Recommendation Systems, Shenzhen Jul. – Aug. 2024

Tencent CSIG | Target-Speaker ASR, Beijing Jun. – Nov. 2023

Baidu Paddle | PaddleHub Research and Tutorials, Beijing Jun. – Oct. 2021

Honors and Awards

IET Engineers in Society Awards – Digital Futures Oct. 2026

IIEP Research Scholarship Mar. 2026

DCASE 2024 Challenge Judges' Award Oct. 2024

Academic Excellence Scholarship, Tsinghua University Sep. 2021

Comprehensive Excellence Scholarship, Tsinghua University (top 10%) Sep. 2020

Other Publications

[1] Xinhu Zheng, **Anbai Jiang**, et al. *Depth-Aware Hybrid Adaptation of Audio Foundation Encoders for Robust Industrial Anomalous Sound Detection.* **SLT 2026**

[2] Wenrui Liang*, Yihong Qiu*, **Anbai Jiang**, et al. *Refgen: Reference-guided synthetic data generation for anomalous sound detection.* **ICASSP 2026**

[3] Bing Han, **Anbai Jiang**, et al. *Exploring self-supervised audio models for generalized anomalous sound detection.* **TASLP 2025**

[4] Bing Han, Wen Huang, Zhengyang Chen, **Anbai Jiang**, et al. *Data-efficient low-complexity acoustic scene classification via distilling and progressive pruning.* **ICASSP 2025**

[5] Xinhu Zheng, **Anbai Jiang**, et al. *Improving anomalous sound detection via low-rank adaptation fine-tuning of pre-trained audio models.* **SLT 2024**

[6] Bing Han*, Zhiqiang Lv*, **Anbai Jiang**, et al. *Exploring large scale pre-trained models for robust machine anomalous sound detection.* **ICASSP 2024**

[7] Qijun Hou, **Anbai Jiang**, et al. *Decoupling detectors for scalable anomaly detection in AIoT systems with multiple machines.* **GLOBECOM 2023**

*Equal contribution.