

Xuanjun Chen

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Research Interest

- My research interests include deep learning and speech processing, especially in audio coding [1, 2], model compression[3, 4], multimodal learning [3, 5], and robustness [4, 5]. I am honored to receive a **Google Conference Scholarship** in 2024.

Education

National Taiwan University (NTU)

PH.D. STUDENT IN GRADUATE INSTITUTE OF COMMUNICATION ENGINEERING

M.S. IN COMPUTER SCIENCE AND INFORMATION ENGINEERING, GPA 4.19/4.30

- Advisor: Professor **Hung-yi Lee** and **Jyh-Shing Roger Jang**

Taipei Taiwan

Sep. 2023 - Present

Sep. 2020 - Jan. 2023

National Taiwan University of Science and Technology (Taiwan Tech)

B.S. IN COMPUTER SCIENCE AND INFORMATION ENGINEERING, GPA: 4.11/4.30

Taipei Taiwan

Sep. 2018 - Jun. 2020

Shenzhen Institute of Information Technology (SZIIT)

J.C. IN ELECTRONIC INFORMATION ENGINEERING TECHNOLOGY

Shenzhen, China

Sep. 2015 - Jul. 2018

Publications

* indicates equal contribution

[1] Towards audio language modeling-an overview

HAIBIN WU, **XUANJUN CHEN**, YI-CHENG LIN, KAI-WEI CHANG, HO-LAM CHUNG, ALEXANDER H LIU, HUNG-YI LEE

Submitted to SPL 2024

[arXiv]

[2] Codec-SUPERB: An In-Depth Analysis of Sound Codec Models

HAIBIN WU, HO-LAM CHUNG, YI-CHENG LIN, YUAN-KUEI WU, **XUANJUN CHEN**, YU-CHI PAI, HSIU-HSUAN WANG, KAI-WEI CHANG, ALEXANDER H LIU, HUNG-YI LEE

Submitted to ACL 2024

[arXiv] [Code] [Leaderboard]

[Huggingface]

[3] Multimodal Transformer Distillation for Audio-Visual Synchronisation

XUANJUN CHEN, HAIBIN WU, CHUNG-CHE WANG, HUNG-YI LEE, AND JYH-SHING ROGER JANG

IEEE ICASSP 2024

[IEEE] [arXiv] [Code]

[5] Push-Pull: Characterizing the Adversarial Robustness for Audio-Visual Active Speaker Detection

XUANJUN CHEN*, HAIBIN WU*, HELEN MENG, HUNG-YI LEE, AND JYH-SHING ROGER JANG

IEEE SLT 2022

[IEEE] [arXiv] [Demo] [Poster]

[4] Adversarial Speaker Distillation for Countermeasure Model on Automatic Speaker Verification

YEN-LUN LIAO*, **XUANJUN CHEN***, CHUNG-CHE WANG, AND JYH-SHING ROGER JANG

ISCA SPSC 2022

[ISCA] [arXiv]

Research Experience

[~] indicates the research topics

Speech Processing and Machine Learning Lab, NTU

RESEARCH ASSISTANT, ADVISOR: PROF. HUNG-YI LEE

Taipei Taiwan

Sep. 2023 - Present

- **[Audio coding]** Neural codecs overview survey and benchmarking [1, 2].
- **[Robustness]** Design neural codec-based adversarial sample detection method based on Descript-audio-codec, surpassing seven prior SOTA detection methods. (**Submitted to Interspeech 2024**)
- **[Robustness]** Propose a SingGraph model for singing voice deepfake detection, which improves EER relatively for seen singers by 13.2%, for unseen singers by 24.3%, and unseen singers using different codecs by 37.1%. (**Submitted to Interspeech 2024**)

Multimedia Information Retrieval Lab, NTU

RESEARCH ASSISTANT, ADVISOR: PROF. JYH-SHING ROGER JANG

Taipei Taiwan

Oct. 2020 - Sep. 2023

- **[Compression]** Proposed multimodal Transformer distillation for the audio-visual synchronization model, reducing teacher parameters by 83.52%, achieving competitive performance and providing comprehensive analysis. [3]
- **[Compression]** Proposed ASD-ResNetSE model combines generalized end-to-end pre-training and adversarial fine-tuning, achieving competitive performance with only 22.5% teacher parameters and 19.4% teacher MACs. [4]
- **[Robustness]** Revealed the vulnerability of the audio-visual active speaker detection model in many ways, such as single- and multi-modal attacks, three-attack algorithms, white- and black-box attackers, and training-aware and inference-aware scenarios.[5]
- **[Robustness]** Proposed audio-visual interaction loss enables inter-class dispersion and intra-class compactness, which outperforms the adversarial training by 33.14 mAP (%) under multi-modal attacks. [5]

Industry Cooperation

TAIHUCAIS: TAIwan Humanities Conversational AI Knowledge Discovery System

Taipei Taiwan

TEAM LEADER, ADVISOR: PROF. HUNG-YI LEE AND PROF. JYH-SHING ROGER JANG (SPONSORED BY NSTC)

Jan. 2024 - Present

- **Goal:** Build a retrieval augmented generation system based on large language models for Taiwanese humanistic knowledge
- **Responsibilities:** Lead and mentor a team of around 10 members in conducting sub-research projects, which include prompt engineering, dataset construction, retrieval system development, and instruction fine-tuning.

Advanced Technologies for Designing Trustable AI Services

Taipei Taiwan

TEAM LEADER, ADVISOR: PROF. HUNG-YI LEE AND PROF. JYH-SHING ROGER JANG (SPONSORED BY NSTC)

Sep. 2023 - Present

- **Goal:** To conduct research on trustworthy artificial intelligence and develop a biometric identification system.
- **Responsibilities:** Lead and mentor a team of 5 master's students in conducting sub-research projects, which include the construction of an audio-visual deepfake dataset and the development of a model to detect deepfake singing voices.

Honors and Awards

SCHOLARSHIP

2024	Google Conference Scholarship (Asia-Pacific) , Google Inc.	Travel Grant
2020-2023	Distinguished Academic Record Award (4 years) , Taipei Kwong Tong Community Associations	Acad. Scholarship
2018-2020	Certificate of Achievement (3 semesters) , Department of CSIE, Taiwan Tech	Top 5%
2017	3rd Prize of Academic Award , Department of EIET, SZIIT	Top 20%
2016	National Encouragement Scholarship , Chinese Ministry of Education	Only 3%

COMPETITION

2021	The logical access track of the ASVspoof 2021 challenge , Interspeech 2021	3rd/42 Teams Worldwide
2017	National Bronze Award and Guangdong Provincial Gold Award , the 3rd China College Students' "Internet +" Innovation and Entrepreneurship Competition	3rd Nationwide

Professional Services

INTERNATIONAL SERVICES

2024	Organizer , Codec-SUPERB Challenge at IEEE 2024 Spoken Language Technology Workshop (SLT 2024)
2024	Reviewer , The 62nd Annual Meeting of the Association for Computational Linguistics (ACL 2024)
2024	Reviewer , The 2024 Joint International Conference on Computational Linguistics, Language Resources and Evaluation (LREC-COLING 2024)
2023-2024	Reviewer , The 2023-2024 IEEE International Conference on Acoustics, Speech and Signal Processing (ICASSP'23'24)

TEACHING ASSISTANT

2024 Spr. **EE5200: Introduction to Generative AI**, National Taiwan University

Cross-functional Leadership and Services

2023-2024	Administrative Assistant , NVIDIA-NTU Artificial Intelligence Joint Research Center, National Taiwan University
2021-2022	Vice Director , Mainland Alumni Association, National Taiwan University
2019	Head Volunteer , The Fourth Cross-Strait Youth Maker Competition, Hosted by Tongji University, Shanghai, China
2019	Propaganda Minister and Teaching Material Leader , Asia-Pacific University Volunteers Association, Taiwan Tech
2017-2018	Team Leader , Started a photography studio business with 5 members while studying at SZIIT
2016-2017	Minister , Led 20 members of the propaganda department of SZIIT's largest Speaking Club, akin to Toastmasters Clubs

Skills

Programming	Python, C, C++, LaTeX
Machine Learning Related	PyTorch, PyTorch Lightning, Numpy, Pandas, Matplotlib
Languages	Mandarin, Cantonese, English