

# Kai-Wei Chang

PHD STUDENT - NATIONAL TAIWAN UNIVERSITY

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## Research Interests

Self-supervised Learning, Spoken Language Modeling, Text-to-Speech, Voice Conversion

## Education

### National Taiwan University

Taipei, Taiwan

PH.D. STUDENT IN COMMUNICATION ENGINEERING

Sept. 2021 - Present

- Advisor: Prof. Hung-yi Lee
- Direct pursuit of the Ph.D. degree.
- M.S. student in Graduate Institute of Electrical Engineering from Sep. 2020 to June 2021.

### National Taiwan University

Taipei, Taiwan

B.S. IN ELECTRICAL ENGINEERING

Sept. 2016 - June. 2020

## Publications

### [1] Prompting and Adapter Tuning for Self-supervised Encoder-Decoder Speech Model

IEEE ASRU 2023

*Kai-Wei Chang, Ming-Hsin Chen, Yun-Ping Lin, Jing Neng Hsu, Chien-yu Huang, Shang-Wen Li, Hung-Yi Lee*

### [2] SUPERB @ SLT 2022: Challenge on Generalization and Efficiency of Self-Supervised Speech Representation Learning

SLT 2022

*Tzu-hsun Feng, Annie Dong, Ching-Feng Yeh, Shu-wen Yang, Tzu-Quan Lin, Jiatong Shi, Kai-Wei Chang, Zili Huang, Haibin Wu, Xuankai Chang, Shinji Watanabe, Abdelrahman Mohamed, Shang-Wen Li, Hung-yi Lee*

### [3] SpeechPrompt: An Exploration of Prompt Tuning on Generative Spoken Language Model for Speech Processing Tasks

INTERSPEECH 2022

*Kai-Wei Chang, Wei-Cheng Tseng, Shang-Wen Li, Hung-yi Lee*

### [4] Toward Degradation-Robust Voice Conversion

ICASSP 2022

*Kai-Wei Chang\*, Chen-yu Huang\*, Hung-yi Lee*

### [5] SpeechNet: A Universal Modularized Model for Speech Processing Tasks

arXiv preprint

*Yi-Chen Chen, Kai-Wei Chang, Po-Han Chi, Shu-wen Yang, Jheng-hao Lin, Sung-Feng Huang, Da-Rong Liu, Chi-Liang Liu, Cheng-Kuang Lee, Hung-yi Lee*

### [6] Dynamically Expanded CNN Array for Video Coding

ICIGP 2020

*Everett Fall, Kai-Wei Chang, Liang-Gee Chen*

## Industry-Cooperation

### Meta

Feb. 2022 - Present

- Participated in Speech-to-speech translation project.
- Crawled Hokkien data for the Hokkein-English speech translation system.

### ASUS

Nov. 2021 - Present

- Building Taiwanese (Hokkien) recognition and translation system.

### BoniO Inc.

Oct. 2021 - June 2022

- Built Taiwanese (Hokkien) pronunciation evaluation system.
- Built Taiwanese Text-to-Speech (TTS) system.

## Research Experience

### NTU, Speech Processing and Machine Learning Lab.

Taipei, Taiwan

SUPERVISOR: PROF. HUNG-YI LEE

Sept. 2020 - Present

- Prompt tuning on spoken language models [1][3].
- Researched on speech synthesis technology [4][5].
- Taiwanese (Hokkein) speech processing, including ASR, TTS, speech-translation.

### JSALT Workshop 2022

Baltimore, Maryland

TEAM LEADER: HUNG-YI LEE, SHANG-WEN LEE

June 2022 - Aug. 2022

- Explored prompt tuning paradigm on self-supervised speech pre-trained models [1][3].
- Integrated various technologies developed in the JSALT workshop into a single model.

## Digital Signal Processing & Integrated Circuit Design Lab

SUPERVISOR: PROF. LIANG-GEE CHEN

- Applied dynamic neural networks for efficient video coding [6].
- Built tree-managed neural networks for 3D video prediction.

Taipei, Taiwan

Sept. 2018 - June 2019

## Work Experience

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### Meta

RESEARCH SCIENTIST INTERN

- Conducted research on speech enhancement utilizing speech language models.

Pittsburgh, PA, US

June 2023 - Dec. 2023

### OmniEyes

SOFTWARE ENGINEER INTERN

- Analyzed and visualized GPS data.
- Designed a data-driven delivery suggestion system.

Taipei, Taiwan

July 2019 - Mar. 2020

### Speech Processing Lab.

MANAGEMENT INFORMATION SYSTEM ENGINEER

- Managing computing clusters in Speech Processing Lab.

Taipei, Taiwan

Sept. 2020 - Sept. 2021

### NTU's Computer & Information Networking Center

RESEARCH ASSISTANT

- Built an ELK stack cluster for visualizing mail logs.
- Managed the server of the network management system in NTU.
- Fixed web security vulnerabilities.

Taipei, Taiwan

March 2018 - July 2020

## Teaching Assistant & Leadership

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### Deep Learning for Human Language Processing, 2022 Fall

TEACHING ASSISTANT

- Leading the research topic: Feature Disentanglement for Self-supervised Speech Models.

Instructor: Prof. Hung-yi Lee

Sept. 2022 - Present

### Deep Learning for Human Language Processing, 2022 Spring

TEACHING ASSISTANT

- Led the research topic: Prompt / Adapter for Pre-trained Self-Supervised Speech Models.

Instructor: Prof. Hung-yi Lee

Feb. 2022 - June 2022

### Machine Learning, 2021 Spring

HEAD TEACHING ASSISTANT

- Led and coordinated with over 40 teaching assistants and over 1300 students.

Instructor: Prof. Hung-yi Lee

Feb. 2021 - June 2021

### Linear Algebra, 2020 Fall

HEAD TEACHING ASSISTANT

- Led and coordinated with over 6 teaching assistants and about 130 students.

Instructor: Prof. Hung-yi Lee

Sep. 2020 - Jan. 2021

## Professional Activities

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### Program Committee

- **AAAI 2022 SAS workshop** - The 2nd Workshop on Self-supervised Learning for Audio and Speech Processing

### Tutorial

- **ICASSP2023** - Title: Parameter-Efficient Learning for Speech and Language Processing: Adapters, Prompts, and Reprogramming

### Reviewer

- **ICLR** - International Conference on Learning Representations
- **ISCSLP** - International Symposium on Chinese Spoken Language Processing
- **ICASSP** - International Conference on Acoustics, Speech, and Signal Processing
- **JETAI** - Journal of Experimental & Theoretical Artificial Intelligence