

# Guan-Ting Lin

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## Research Interest

Speech and Audio Processing, Self-Supervised Learning, Spoken Language Understanding, Speech Paralinguistics.

## Education

### National Taiwan University

Taipei, Taiwan

DIRECT PHD FROM M.S. IN COMMUNICATION ENGINEERING, DATA SCIENCE AND SMART NETWORKING GROUP

Sep. 2021 – Present

- **GPA:** 4.24/4.3; Ranking: 15/158
- Speech Processing and Machine Learning Laboratory. Advised by Prof. [Hung-yi Lee](#).
- **Selected Courses:** Deep Learning for Human Language Processing, Machine Learning, Digital Speech Processing, Security and Privacy of Machine Learning, Deep Learning for Music Analysis and Generation.

### National Tsing Hua University

Hsinchu, Taiwan

B.S. IN BIOMEDICAL ENGINEERING & GRADUATE-LEVEL PROGRAM. ARTIFICIAL INTELLIGENCE

Sep. 2017 – Jun. 2021

- **GPA:** 4.08/4.3; Ranking: 1/48
- **Honors:** 3 Deans's List (top 5% students of the department), Phi Tau Phi Award, The Zhu Shun Yi He Qin Scholarship
- **Selected Courses:** Introduction to Artificial Intelligence, Introduction to Machine Learning, Deep Learning, Data Mining, Deep Learning and NLP Research Methodologies, Analysis and synthesis of digital audio signals.

## Experience

### Amazon Alexa AI

Seattle, United States

APPLIED SCIENTIST II INTERN

June. 2023 – Sep. 2023

- Worked with Prashanth Gurunath Shivakumar at Alexa ASR LM team on Paralinguistics-enhanced Multi-modal Large Language Model for conversational speech. The result was accepted by ICASSP 2024.

### Amazon Alexa AI

Cambridge, United States

APPLIED SCIENTIST I INTERN

July. 2022 – Oct. 2022

- Worked with Chieh-Chi Kao and Qingming Tang at Alexa Perceptual Team. Proposed a weight-sharing Neural Architecture Search (NAS) approach on Acoustic Event Classification (AEC). By just training one supernet, we can search for specialized sub-networks across diverse resource constraints. The work was accepted by ICASSP 2023.

### 8th JASLT Summer Workshop

Baltimore, United States

VISITING RESEARCHER

July. 2022

- Work with Prof. Nigel Ward on self-supervised pre-training for prosody. The work was accepted to SLT 2022 and won the Best Paper Award.

### Speech Processing and Machine Learning Lab @National Taiwan University

Taipei, Taiwan

UNDERGRADUATE RESEARCHER

July. 2020 – Aug. 2021

- Advisor: [Hung-yi Lee](#)
- Improved end-to-end speech recognition model from 21.59 WER to 11.42 WER on Librispeech 100 hour dataset. Implemented CTC-based Phoneme Recognition for the SUPERB benchmark, which is a large-scale benchmark for self-supervised pre-trained speech model.

## Publications & Preprints

- Guan-Ting Lin, Prashanth Gurunath Shivakumar, Ankur Gandhe, Chao-Han Huck Yang, Yile Gu, Shalini Ghosh, Andreas Stolcke, Hung-yi Lee, Ivan Bulkyo, "Paralinguistics-Enhanced Large Language Modeling of Spoken Dialogue", **ICASSP 2024**
- Chyi-Jiunn Lin, Guan-Ting Lin, Yung-Sung Chuang, Wei-Lun Wu, Shang-Wen Li, Abdelrahman Mohamed, Hung-yi Lee, Lin-shan Lee, "SpeechDPR: End-to-End Spoken Passage Retrieval for Open-Domain Spoken Question Answering", **ICASSP 2024**
- Guan-Ting Lin\*, Guan-Wei Wu\*, Guan-Ting Lin, Shang-Wen Li, Hung-yi Lee. "Improving Textless Spoken Language Understanding with Discrete Units as Intermediate Target", **Interspeech 2023** [\[link\]](#)
- Guan-Ting Lin, Qingming Tang, Chieh-Chi Kao, Viktor Rozgic, Chao Wang. "Weight-sharing Supernet for Searching Specialized Acoustic Event Classification Networks Across Device Constraints", **ICASSP 2023 (Poster)** [\[link\]](#)
- Guan-Ting Lin\*, Chi-Luen Feng\*, Wei-Ping Huang, Yuan Tseng, Tzu-Han Lin, Chen-An Li, Hung-yi Lee, Nigel G. Ward. "On the Utility of Self-supervised Models for Prosody-related Tasks", **SLT 2022 (Best Paper Award)**
- Guan-Ting Lin, Yung-Sung Chuang, Ho-Lam Chung, Shu-wen Yang, Hsuan-Jui Chen, Shang-Wen Li, Abdelrahman Mohamed, Hung-yi Lee, Lin-shan Lee. "DUAL: Textless Spoken Question Answering with Speech Discrete Unit Adaptive Learning", **Interspeech 2022 (Poster)** [\[link\]](#)
- Guan-Ting Lin, Shang-Wen Li, Hung-Yi Lee. "Listen, Adapt, Better WER: Source-free Single-utterance Test-time Adaptation for Automatic Speech Recognition", **Interspeech 2022 (Oral)** [\[link\]](#)
- Guan-Ting Lin\*, Chan-Jan Hsu\*, Da-Rong Liu, Hung-Yi Lee, Yu Tsao. "Analyzing the Robustness of Unsupervised Speech Recognition", **ICASSP 2022** [\[link\]](#)
- Shu-wen Yang, Po-Han Chi, Yung-Sung Chuang, Cheng-I Jeff Lai, Kushal Lakhota, Yist Y. Lin, Andy T. Liu, Jiatong Shi, Xuankai Chang, Guan-Ting Lin, Tzu-Hsien Huang, Wei-Cheng Tseng, Ko-tik Lee, Da-Rong Liu, Zili Huang, Shuyan Dong, Shang-Wen Li, Shinji Watanabe, Abdelrahman Mohamed, Hung-yi Lee. "SUPERB: Speech processing Universal PERFORMANCE Benchmark", **Interspeech 2021** [\[link\]](#)
- Guan-Ting Lin, Manuel Giambi. "Context-gloss Augmentation for Improving Word Sense Disambiguation". *arXiv preprint arXiv:2110.07174*

## Honors & Awards

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### SCHOLARSHIP

2023	<b>Best Paper Award</b> , one of the two best papers in IEEE SLT 2022, awarded with 500 USD	Doha, Qatar
2023	<b>NTU Elite Doctoral Scholarship</b> , A 4-year scholarship, only one student of each department.	Taiwan
2023	<b>GICE Elite Doctoral Scholarship</b> , The joint 4-year scholarship from Graduate Institute of Communication Engineering and NVIDIA	Taiwan
2022	<b>ISCA Travel Grant</b> , awarded with 600 Euros for attending Interspeech 2022, only 60 students were selected.	Incheon, Korea
2022	<b>Appier scholarship for international top AI conferences</b> , awarded with 25000 NTD for Interspeech 2022.	Taiwan
2020	<b>The Zhu Shun Yi He Qin Scholarship</b> , the highest honor for National Tsing Hua University student with about 3000 USD prize.	Taiwan
Jun. 2021	<b>Phi Tau Phi Award</b> , top 1 graduation student of the department.	Taiwan
2018–9	<b>3 Deans's List</b> , top 5% students of the department, (2018 Spring/2018 Fall/2019 Fall in NTHU).	Taiwan

### COMPETITION

Feb. 2021	<b>Excellent Achievement</b> , 2020 AI CUP Competition on Medical Dialogue Decision: Deidentity Task, 15/531 (top 3%) with 300 USD prize	Taiwan
2020	<b>Top 40</b> , From IP TO IPO program (FITI). Innovation and entrepreneurship competition with 1000 USD prize	Taiwan
2019	<b>Finalist</b> , Innovative Project Award of the College of Nuclear Science with 800 USD reward	Taiwan

## Teaching

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### Machine Learning Summer School 2021, Taipei [\[link\]](#)

National Taiwan University

HEAD TEACHING ASSISTANT

2021 summer

31 virtual Machine Learning courses, Manage Facebook group for 1400 international participants and communicate with world-wide lecturers.

### 2021 Fall - Linear Algebra

National Taiwan University

TEACHING ASSISTANT

2021 Fall

Design 1D and 2D Discrete cosine transform homework for JPEG compression.

### 2021 Fall - Speech Processing Special Project

National Taiwan University

TEACHING ASSISTANT

2021 Fall

Design the special project for unsupervised speech recognition for about 20 students.

### 2022 Spring - Machine Learning 2022 Spring [\[link\]](#)

National Taiwan University

TEACHING ASSISTANT

2022 Spring

Design assignment for Black-box Adversarial Attack on CIFAR 10.

## Projects

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### End-to-End Speech Recognition Model

TRAIN A END-TO-END JOINT CTC/ATTENTION-BASED MODEL

Achieve 11.42% WER on Librispeech 100hr dataset. Code is available in [E2E-ASR-Pytorch](#)

### Meta-StyleSpeech

HELP TRAINING A 16KHZ MELGAN VOCODER FOR MEL-TO-WAV CONVERSION.

Cooperate with the [Meta-StyleSpeech](#) project.

## Skills

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**Programming** Python, C, C++, Matlab, LaTeX

**Deep Learning Framework** Pytorch, Tensorflow, PyTorch Lightning