

Chung-Ming Chien

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Research Interests

Speech-text joint learning, self-supervised speech representations and units, speech generation, multi-modal learning, representation learning

Education

Toyota Technological Institute at Chicago (TTIC)

PH.D. IN COMPUTER SCIENCE

- Advisor: Karen Livescu
- GPA: 4.0/4.0

Chicago, IL

Sep. 2022 - Present

National Taiwan University (NTU)

M.S. IN COMPUTER SCIENCE AND INFORMATION ENGINEERING

- Thesis: End-to-End Prosody Learning Frameworks for Multi-Speaker Speech Synthesis
- Advisors: Lin-shan Lee & Hung-yi Lee at Speech Processing Lab
- GPA: 4.02/4.3

Taipei, Taiwan

Sep. 2019 - Aug. 2021

National Taiwan University (NTU)

B.S.E. IN ELECTRICAL ENGINEERING

- GPA: 4.08/4.3; Ranked 25/256 (9%) with two Dean's List Awards

Taipei, Taiwan

Sep. 2015 - Aug. 2019

Experience

Speech and Language Group, TTIC

GRADUATE STUDENT RESEARCHER

- Advisor: Karen Livescu
- Revealed **word-level language structures** intrinsically encoded in self-supervised speech representations [\[arXiv\]](#)
- Discovered **text-to-speech transferability** in speech-text models, which enables **zero-shot spoken language understanding** [\[ASRU'23\]](#)

Chicago, IL

Sep. 2022 - Present

FAIR (Fundamental AI Research) at Meta

RESEARCH SCIENTIST INTERN

- Mentor: Andros Tjandra
- Worked on **universal speech generation** and additionally conditioned the model on **unnormalized/punctuated transcripts**

Menlo Park, CA

Jun. 2023 - Dec. 2023

Hotpot.ai

MACHINE LEARNING RESEARCHER

- Researched on **text-to-image generaiton** by combining pre-trained word representations with **diffusion models**

Remote

Jun. 2022 - Aug. 2022

World Quant LLC

QUANTITATIVE RESEARCH INTERN

- Developed novel Alpha ideas and evaluated their performance with historical market data

Taipei, Taiwan

Jun. 2022 - Jul. 2022

Amazon Alexa

APPLIED SCIENTIST INTERN

- Mentors: Adam Gabryś and Jaime Lorenzo-Trueba
- Improved extremely **low-resource speaker-adaptive text-to-speech (TTS)** by modeling content and speaker information separately [\[ICASSP'22\]](#)
- Reduced the gap between synthesized and real speech by over 30%

Cambridge, UK

Jul. 2021 - Nov. 2021

Speech Processing Laboratory, NTU

STUDENT RESEARCHER

- Advisors: Lin-shan Lee and Hung-yi Lee
- Disentangled **speaker and phonetic information in self-supervised speech representations** for the task of voice conversion (VC) [\[InterSpeech'21\]](#)
- Proposed **SOTA zero-shot any-to-any VC** by learning **sub-phoneme alignments between utterances with Transformer attention** [\[ICASSP'21\]](#)
- Proposed **generative speaker embedding pre-training** for speech synthesis [\[ICASSP'21\]](#)
- Led a team to win the 2nd prize of the IEEE M2VoC Challenge on **low-resource voice cloning** [\[M2VoC Challenge\]](#)
- Built and maintained a state-of-the-art TTS system **FastSpeech 2** [\[Github\]](#)
- Developed **hierarchical prosody modeling** in TTS [\[SLT'21\]](#)

Taipei, Taiwan

Sep. 2018 - Jul. 2021

- Advisor: Pei-Yuan Wu
- Discovered a critical privacy leakage issue in a privacy-preserving support vector machine

Publications [†] indicates equal contribution

CONFERENCE PROCEEDINGS

- [1] Ju-Chieh Chou, **Chung-Ming Chien**, Wei-Ning Hsu, Karen Livescu, Arun Babu, Alexis Conneau, Alexei Baevski, and Michael Auli, “**Toward Joint Language Modeling for Speech Units and Text**,” in *Findings of EMNLP*, 2023.
- [2] **Chung-Ming Chien**, Mingjiamei Zhang, Ju-Chieh Chou, and Karen Livescu, “**Few-Shot Spoken Language Understanding via Joint Speech-Text Models**,” in *ASRU*, 2023.
- [3] Adam Gabryś, Goeric Huybrechts, Manuel Sam Ribeiro, **Chung-Ming Chien**, Julian Roth, Giulia Comini, Roberto Barra-Chicote, Bartek Perz, and Jaime Lorenzo-Trueba, “**Voice Filter: Few-Shot Text-to-Speech Speaker Adaptation Using Voice Conversion as a Post-Processing Module**,” in *ICASSP*, 2022.
- [4] Jheng-hao Lin, Yist Y. Lin, **Chung-Ming Chien**, and Hung-yi Lee, “**S2VC: A Framework for Any-to-Any Voice Conversion with Self-Supervised Pretrained Representations**,” in *Interspeech*, 2021.
- [5] **Chung-Ming Chien**, Jheng-Hao Lin, Chien-yu Huang, Po-chun Hsu, and Hung-yi Lee, “**Investigating on Incorporating Pretrained and Learnable Speaker Representations for Multi-Speaker Multi-Style Text-to-Speech**,” in *ICASSP*, 2021.
- [6] **Chung-Ming Chien**[†], Yist Y. Lin[†], Jheng-Hao Lin, Hung-yi Lee, and Lin-shan Lee, “**Fragmentvc: Any-To-Any Voice Conversion by End-To-End Extracting and Fusing Fine-Grained Voice Fragments with Attention**,” in *ICASSP*, 2021.
- [7] **Chung-Ming Chien** and Hung-yi Lee, “**Hierarchical Prosody Modeling for Non-Autoregressive Speech Synthesis**,” in *SLT*, 2021.

PRE-PRINTS

- [1] Ankita Pasad, **Chung-Ming Chien**, Shane Settle, and Karen Livescu, “**What Do Self-Supervised Speech Models Know about Words?.**,” preprint *arXiv:2307.00162*, 2023.
- [2] Ju-Chieh Chou, **Chung-Ming Chien**, and Karen Livescu, “**AV2Wav: Diffusion-Based Re-synthesis from Continuous Self-supervised Features for Audio-Visual Speech Enhancement**,” preprint *arXiv:2309.08030*, 2023.

Honors

SCHOLARSHIP

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|------|---|----------------|
| 2023 | Government Scholarship to Study Abroad , Ministry of Education of Taiwan (\$32,000 in 2 years) | Taiwan |
| 2020 | Advanced Speech Technologies Scholarship , NTU EECS (\$17,000) | Taipei, Taiwan |
| 2016 | NTUEE60 Scholarship , NTU EE (\$3,500) | Taipei, Taiwan |

AWARDS

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|-----------|---|----------------|
| 2021 | 2rd Place , IEEE ICASSP 2021 M2VoC Challenge | Virtual |
| 2020 | Top 20 Finalist , Trans Action Award | Taipei, Taiwan |
| 2019 | Cathay United Bank Special Award , Make NTU | Taipei, Taiwan |
| 2016-2017 | Dean’s List Awards (Two-Time) , NTU EE | Taipei, Taiwan |

LEADERSHIP

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|-----------|--|----------------|
| 2019-2020 | Captain , NTU Baseball Varsity Team | Taipei, Taiwan |
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NON-ACADEMIC

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|-----------|---|---------------|
| 2023 | 1st Place within UChicago-Affiliated Athletes , J.P. Morgan Corporate Challenge 3.5-Mile Road Race | Chicago, IL |
| 2019&2021 | 5th Places (Two-Time) , University Baseball League of Taiwan (equivalent to NCAA Division III) | Taiwan |
| 2019 | Golden Medal, Men’s Half-Iron Relay , Yilan National Triathlon Championships | Yilan, Taiwan |

Service

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| 2022 | Reviewer , IEEE JSTSP |
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Talks

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|-----------|---|----------------|
| Nov. 2022 | Self-Supervised Pre-Trained Voice Conversion , TTIC Student Workshop | Chicago, IL |
| Nov. 2021 | Few-Shot Speaker Adaptive TTS by Learning from Non-Target Speakers , Amazon Text-to-Speech Group | Cambridge, UK |
| Aug. 2020 | Speech Synthesis in the Deep Learning Era , AI Summer School 2020, NTU | Taipei, Taiwan |

Teaching

National Taiwan University

Taipei, Taiwan

TEACHING ASSISTANT

- EE5184 Machine Learning, Spring 2020 and Spring 2019, instructed by Hung-yi Lee
- EE4049 Speech Processing Project, Spring 2020 and Fall 2019, instructed by Lin-shan Lee
 - Led 26 undergraduate students to do research in speech and natural language processing
- EE4037 Digital Speech Processing, Fall 2019, instructed by Lin-shan Lee
- EE2011 Signals and Systems, Spring 2018, instructed by Lin-shan Lee

Projects

FastSpeech2

OPEN-SOURCED PROJECT

Jun., 2020

- Open-sourced TTS project with **over 1.4k stars on Github**, supporting multiple languages and more than 100 speakers [\[Github\]](#)

TTS without T

COURSE PROJECT

Jun., 2019

- Applied discrete speech units unsupervisedly discovered by the multilabel-binary vectors (MBV) and the vector quantized variational auto-encoder (VQ-VAE) to a VC task [\[Link\]](#)

Skills

Natural Languages	Mandarin (native), Taiwanese (native), English (fluent), German (basic)
Programming Languages	Python, C/C++, Shell Script, MATLAB, Verilog, HTML+CSS
Toolkits	PyTorch, MXNet, ESPnet, Kaldi, Git, \LaTeX