Liang-Yuan "Leo" Wu

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Education

University of Michigan Sep 2022 - May 2024
Master of Science in Computer Science & Engineering *Michigan, USA*

National Taiwan University Sep 2017 - Aug 2021
Bachelor of Science in Electrical Engineering *Taipei, Taiwan*

Professional Experience

Soundability Lab May 2023 – Present
Research Assistant, advised by Prof. Dhruv Jain *Michigan, USA*

- Led **4** projects integrating machine learning, HCI, and medical school collaboration to design **accessible AI systems**; first author on **1 filed patent, 4 published paper, and 2 under-submission papers**; co-authored 2 additional papers.
- Developed a real-time speech-to-text captioning system for lab meetings and clinical scenarios, improving accessibility and communication for DHH researchers and patients.

Dragon Cloud AI May 2020 – May 2021
Machine Learning Engineer Intern (remote) *California, USA*

- Developed an **AWS**-based speech processing software to transcribe classroom recordings, detecting English portions in Mandarin-English bilingual classrooms to analyze teaching effectiveness.
- Implemented an English accent scoring system using **PyTorch**, providing automated numerical feedback to assist non-native speakers in evaluating their pronunciation.

Speech Processing and Machine Learning Laboratory Aug 2019 – Aug 2021
Student Researcher, advised by Prof. Lin-Shan Lee and Prof. Hung-Yi Lee *Taipei, Taiwan*

- Developed a Mandarin **ASR** training pipeline and investigated code-switching speech patterns, presenting findings at Machine Learning Summer School 2021.
- Implemented and demonstrated explainable AI algorithms in natural language processing and computer vision, delivering these as interactive homework examples in a machine learning course with **1,000+** students.

Selected Projects

SoundNarratives | *Python, Huggingface, React.js, Flask, Google Cloud Platform* [GitHub]

- Optimized an audio-language model for auditory scene descriptions through **prompt engineering** based on DHH user needs.
- Conducted qualitative and quantitative evaluations with DHH participants, showing strong preference for the system.

CARTGPT | *PyTorch* [Poster, GitHub]

- Developed a real-time caption correction system powered by **LLM**s, improving human captioners (CART) and ASR models.
- Achieved a **17.3%** (ASR) and **5.6%** (CART) WER reduction in noisy conditions, enhancing accuracy in challenging environments.

AdaptiveSound | *TensorFlow, Kotlin, Android Studio* [Paper, GitHub]

- Developed a mobile app for Android, with on-device **TensorFlow Lite** model and a reinforcement-learning feedback loop.
- Released open-source and used by DHH participants in user study, improving model accuracy by **14%**.

Personalizable Speech-Centered Emotion Classifiers | *PyTorch*

- Built multimodal speech emotion recognition models, integrating speech, text, and silence.
- Utilized audio energy analysis and domain adversarial loss to improve speaker adaptation for personalized emotion classification.

Code-Switching Text Data Augmentation | *PyTorch, Transformers* [Poster]

- Designed a synthetic code-switching text generation pipeline for Mandarin-English.
- Leveraged multilingual models (MT5, MBERT), achieving a **2.8%** reduction in perplexity compared to baseline methods.

Technical Skills

Programming Languages: Python, C++, Javascript, HTML/CSS, Kotlin
Machine Learning: PyTorch, TensorFlow, Huggingface, Transformers
Fullstack Development: React.js, Node.js, Flask, FastAPI
Tools & Platforms: GCP, AWS, SQL, Git, Docker

Selected Publications

LY Wu and D Jain, **"SoundNarratives: Rich Auditory Scene Descriptions to Support Deaf and Hard of Hearing People"**, *ASSETS '25*.

LY WU, A Kleiver, D Jain, **"CARTGPT: Real-Time Correction of CART Captions Using Large Language Models"**, *ASSETS '25*.
Best Paper Honorable Mention