Liang-Yuan "Leo" Wu

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Education

University of Michigan

Master of Science in Computer Science & Engineering National Taiwan University Bachelor of Science in Electrical Engineering

Professional Experience

Soundability Lab

Research Assistant, advised by Prof. Dhruv Jain

- Led 4 projects integrating machine learning, HCI, and medical school collaboration to design accessible AI systems; first author on 1 filed patent, 1 published paper, and 3 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

Machine Learning Engineer Intern (remote)

- 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

Student Researcher, advised by Prof. Lin-Shan Lee and Prof. Hung-Yi Lee

- 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

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

CARTGPT: Improving CART Captioning using Large Language Models | PyTorch

- Developed a real-time caption correction system powered by LLMs, 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: An Interactive Feedback-Loop Sound Recognition System | 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 | PvTorch

- 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

- 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

Liang-Yuan Wu and Dhruv Jain, "SoundNarratives: Rich Auditory Scene Descriptions to Support Deaf and Hard of Hearing People", accepted at CHI '25 Generative AI and Accessibility Workshop (under submission as full paper).

Jeremy Zhengqi Huang, Jaylin Herskovitz, Liang-Yuan Wu, Cecily Morrison, Dhruv Jain, "Weaving Sound Information to Support Real-time Sensemaking of Auditory Environments: Co-designing with a DHH User", in CHI '25.

Liang-Yuan Wu, Andrea Kleiver, Dhruv Jain, "CARTGPT: Improving CART Captioning using Large Language Models", in ASSETS '24 🏆 Best Poster Award.

Sep 2022 - May 2024 Michigan, USA Sep 2017 - Aug 2021 Taipei, Taiwan

May 2023 – Present

Michigan, USA

California, USA

[Poster]

[Poster]

Taipei, Taiwan

Aug 2019 - Aug 2021

May 2020 - May 2021