Liang-Yuan "Leo" Wu

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Overview

Working at the intersection of Human-Computer Interaction (HCI) and Artificial Intelligence (AI), where I apply human-centered principles to enhance audio AI for diverse user needs, with a particular emphasis on accessibility for Deaf and Hard-of-Hearing (DHH) individuals.

Education

University of Michigan, MS in Computer Science and Engineering	Sept 2022 – May 2024
University of Edinburgh, Visiting Student(Non-Degree) in School of Informatics	Sept 2021 – Dec 2021
National Taiwan University, BS in Electrical Engineering	Sept 2017 – Aug 2021

Research Experience

Soundability Lab, advised by Prof. Dhruv Jain   May 2023 – Present

- **Improving CART Captioning with Large Language Models**
  - Implemented CARTGPT to correct errored captions made by human captioners or ASR models in real-time.
  - Outperformed CART (+5.6%) and ASR (+17.3%) on a self-collected noisy speech corpus.
- **Communication Accessibility in Health Care**, co-advised by Prof. Michael M. McKee.
  - Developed a real-time captioning system on iPads for clinical settings.
  - Conducted user study with eight DHH individuals to collect their preferences and insights for the application.
- **Adaptive Speech Recognition with DHH-hearing Interactions**
  - Implemented a speech recognition system that could adapt to DHH individuals' speech with the help of hearing individuals' feedback.
  - Conducted user studies with eight groups of DHH-hearing participants and receive positive feedback for the novel interaction.
- **AdaptiveSound Application Development**, the implementation for the ASSETS' 23 paper: *AdaptiveSound: An Interactive Feedback-Loop System to Improve Sound Recognition for Deaf and Hard of Hearing Users*
  - Designed and implemented a sound recognition app on android phones to classify sounds and learn from the environment.
  - Implemented Reinforcement Learning Algorithm with TensorFlow to update the sound recognition model with user inputs.

Speech Processing and Machine Learning Laboratory, advised by Prof. Lin-shan   Aug 2019 – Aug 2021
Lee, and Prof. Hung-yi Lee

- Mandarin-English Text Generation in Lectures
  - Explored synthetic code-switching (Mandarin-English) texts generation with multilingual models including MBERT and MT5.
  - Achieved 2.8% perplexity reduction compared to the baseline.

Publications

Weaving Sound Information to Support Real-time Sensemaking of Auditory Environments: Co-designing with a DHH User
Jeremy Zhengqi Huang, Jaylin Herskovitz, *Liang-Yuan Wu*, Dr Cecily Morrison, Dhruv Jain
Under review

CARTGPT: Improving CART Captioning using Large Language Models   Oct 2024
Liang-Yuan Wu, Andrea Kleiver, Dhruv Jain

(Poster Track) ASSETS '24: Proceedings of the 26th International ACM SIGACCESS Conference on Computers and Accessibility

Talks

Automatic Speech Recognition in Clinical Care	Oct 2024
Presented in Disability Research Symposium, hosted by the CDHW, University of Michigan Medicine.

Improving User Experience in Speech Recognition with Large Language Model	Oct 2023
Presented in 2023 AI Symposium, hosted by the AI Lab, University of Michigan.

Code-Switching Text Data Augmentation	Aug 2021
Presented in Machine Learning Summer School 2021.

Teaching Experience

EECS 592 Foundations of AI (Fall 2023) Graduate Student Instructor	Aug 2023 - Dec 2023
Graduate course, University of Michigan

EE 5184 Machine Learning (Spring 2021) Teaching Assistant	Feb 2021 - June 2021
Graduate course, National Taiwan University

EE 1006 Cornerstone EECS Design and Implementation (Spring 2020) Teaching Assistant	Feb 2020 - June 2020
Undergraduate course, National Taiwan University

Work Experience

Ucarer Inc., AI platform engineer intern	May 2021 – Aug 2021

- Developed a backend operation system for the e-commerce platform, helping Sarcopenia patients to recover.
- Built a customer relationship management system to help evaluating and ranking the need of customers.

Dragoncloud.ai, Machine learning engineer intern (remote)	May 2020 – June 2021

- Developed an AI classroom system that analyzed the proportion and the contents of English that was used during a class.
- Developed an accent scoring model that scores the quality of non-native English speakers' speakings.

Volunteer Activities

ICWSM 2024 Reviewer	Jun 2024
Discover Engineering Workshop Volunteer	Aug 2023
Xplore Engineering Workshop Lecturer	July 2023

Honors and Awards

Dean's List Award	Dec 2021
Y.L. Lin Scholarship	July 2021
Outgoing Exchange Student Scholarship	Dec 2020
Social Devotion Special Award	Nov 2020
2nd Prize, Undergraduate Innovation Award	June 2020

Skills

Programming: Python, Javascript, Node.js, C/C++, Kotlin, PHP

Deep learning: PyTorch, TensorFlow, Transformers, Keras

Web development: React, HTML5, CSS, MongoDB, GraphQL, Laravel, MySQL, Flask