

Yicong (Bryce) Chen

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EDUCATION

University of Washington

Seattle, WA

Ph.D. in Electrical & Computer Engineering

Sep. 2024 – Present

- Advisor: Mari Ostendorf

University of Wisconsin-Madison

Madison, WI

B.S. in Computer Engineering: Machine Learning and Data Science

Sep. 2020 – May 2024

Double Major in Computer Science

- Graduated with Highest Distinction (Top 5%)
- Advisor: Kangwook Lee
- GPA: 3.98/4.00

RESEARCH INTEREST

My current research interests focus on building and assessing **multimodal foundation models** to address real-world problems involving speech, text, and image modalities. Prior to this, I have also worked on continual federated learning, prompt engineering, text-to-image generation, and multimodal in-context learning.

EXPERIENCE

Research Assistant

Sep. 2024 – Present

Advisor: Mari Ostendorf

Seattle, WA

- Developed an evaluation pipeline for an automated sentence recall screener for child speech language disorders.
- Assessed pause-based screening features using **speech LLMs**, ASR models, and alignment tools.
- Fine-tuning an LLM on forced alignment pause labels to predict pause positions and derive perplexity-based atypicality scores, linking pause pattern deviations to atypical child speech outcomes.
- Developing a multi-track conversational **speech synthesis** and editing pipeline for controllable multi-speaker dialogue generation, enabling precise turn-taking, overlap modeling, continuation, and in-place speech editing.
- Designing a tool-use **navigation benchmark** for multi-turn assistant evaluation, and scaling assistant performance through **SFT** on filtered synthetic conversations selected by destination quality and dialogue efficiency.

Undergraduate Researcher

May 2022 – May 2024

Advisor: Kangwook Lee

Madison, WI

- Established a benchmark to evaluate text-to-image in-context learning in **Multimodal** Large Language Models, leveraging automated VLM-based scoring and demonstrating consistent improvements from **fine-tuning**.
- Introduced **coded prompts**, inspired by coding theory, to process multiple inputs simultaneously in LLMs.
- Designed a novel algorithm that mitigates forgetting by leveraging aggregated buffer gradients, ensuring the retention of prior knowledge across clients in **Continual Federated Learning**.
- Introduced zero-shot text embedding edits for count control in CLIP, improving **object counting** with minimal data and transferring the enhanced count signal to **text-to-image generation** for better number fidelity.
- Enhanced the efficacy of Mixed Sample Data Augmentation (MSDA) by introducing self-distillation for relabeling.
- Enhanced low-resolution cosmic data into high-resolution images using diffusion to aid dark matter research.

Undergraduate Researcher

Jan. 2022 – May 2022

Advisor: Dane Morgan

Madison, WI

- Accelerated molecular machine learning by integrating nystroem into the kernel training process with Faber-Christensen-Huang-Lilienfeld (FCHL) representation and kernel ridge regression.

PUBLICATIONS

[1] Can MLLMs Perform Text-to-Image In-Context Learning?
Yuchen Zeng*, Wonjun Kang*, **Yicong Chen**, Hyung Il Koo, Kangwook Lee
Conference on Language Modeling (COLM) 2024

[2] Zero-shot Improvement of Object Counting with CLIP
Ruisu Zhang*, **Yicong Chen***, Kangwook Lee
Robustness of Few-shot and Zero-shot Learning in Foundation Models (R0-FoMo) Workshop @ NeurIPS 2023

[3] Coded Prompts for Large Language Models
Ziqian Lin, **Yicong Chen**, Yuchen Zeng, Kangwook Lee
Robustness of Few-shot and Zero-shot Learning in Foundation Models (R0-FoMo) Workshop @ NeurIPS 2023

[4] FedGP: Buffer-based Gradient Projection for Continual Federated Learning
Shenghong Dai, **Yicong Chen**, Jy-yong Sohn, S M Iftekhharul Alam, Ravikumar Balakrishnan, Suman Banerjee, Nageen Himayat, Kangwook Lee
Federated Learning Systems (FLSys) Workshop @ MLSys 2023 • Oral Presentation • Best Paper Award

[5] AVMemex Exam: A Multimodal Multilingual Multicultural Benchmark for LLMs’ Contextual and Cultural Knowledge and Thinking
Xilin Jiang, Qiaolin Wang, Junkai Wu, Xiaomin He, Zhongweiyang Xu, Yinghao Ma, Minshuo Piao, Kaiyi Yang, Xiuwen Zheng, Riki Shimizu, **Yicong Chen**, . . . , Emmanouil Benetos, Mark Hasegawa-Johnson, Romit Roy Choudhury, Nima Mesgarani
Under review at the Annual Meeting of the Association for Computational Linguistics (ACL) 2026

HONORS

Graduated with Highest Distinction (Top 5%)	2024
Wisconsin Hilldale Undergraduate Research Fellowship	2023
Dean’s Honor List (All Semesters)	2020 – 2024
First Prize, National Olympiad in Informatics in Provinces (NOIP), China	2017
First Prize, National Olympiad in Informatics in Provinces (NOIP), China	2016

PROJECTS

Run Right: Mobile App Design for Personal Running Coach • Developed a mobile app using TensorFlow MoveNet to analyze running form via smartphone video. • Enabled users to record video and receive actionable feedback to improve running mechanics.	Spring 2024
WISC-SP23 architecture microprocessor design • Designed and implemented a 16-bit, 5-stage pipelined processor (WISC-SP23) using Verilog. • Developed a two-way set associative instruction cache, a multi-cycle main memory, and other optimizations.	Spring 2023

SKILLS

Programming Languages: Python, Java, C++, C, MATLAB, Verilog, HTML/CSS, JavaScript
Tools: Latex, Wandb, AWS, Git, Docker, Google Cloud
Libraries: PyTorch, TensorFlow, Hugging Face, Scikit-learn, Pandas, NumPy, Matplotlib
Languages: Mandarin Chinese, English