Haichang Li

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EDUCATION

Purdue University, *West Lafayette, IN* — Dec. 2024*(Expected)*
Bachelor of Computer Information Technology, Minor in Communication — *GPA: 3.95/4.0*
Previously dropped out of EEE Honors Program at UoL&XJTLU with first-class honors grade of Non-degree coursework

PUBLICATIONS

[**C.1**] Brian Ng, Samantha Sudhoff, Haichang Li, Joshua Kamphuis, Tim Nadolsky, Yingjie Chen, Kristen Yeon-Ji Yun, and Yung-Hsiang Lu, "Visualize Music Using Generative Arts," *2024 IEEE Conference on Artificial Intelligence (CAI)* (pp. 1516-1521). IEEE Computer Society. (A separate case study for Mus2Vid, running in parallel with Mus2Vid)

[**Manuscript.1**] Amy Yu*, Haichang Li*, Zhuohao Zhang, Faraz Faruqi, Jun-An Xie, Gene Kim, Mingming Fan, Anhong Guo, Anugs Forbes, Liang He, "Code2Fab: 3D Modeling Support for Blind and Low-Vision Programmers,". *(* indicates equal contribution, will be submitted to IMWUT)*

[**Near Completion**] Mus2Vid Expected submission: Dec ICME 25', A11Y Review Expected submission: Dec TOCHI.

EXPERIENCE

AIM Group, Music&ECE@Purdue University — West Lafayette, IN
Research Assistant & Leader, Supervised by Prof. Yung-hsiang Lu & Prof. Yeon-Ji Yun — *Feb 2023 – Present*
Led a team across backgrounds and 6 time zones(when working remotely), overseeing task delegation, project planning, and timeline management. Provided onboarding and crafted assignments for team members, fostered active communication. Spearheaded system design and prototype development, participated in the user study and led the iterative improvements.

DE4M Lab, CGT@Purdue University — West Lafayette, IN
Research Assistant, Supervised by Prof. Liang He — *Oct 2023 – Present*
Brainstormed and conducted preliminary research under the guidance of the advisor, individually developed the initial fully functional prototype of "Code2Fab." Collaborated with partner to iterate on the system. Shifted focus to "a11y review" project based on the advisor's assignment, analyzed and coded papers to propose a dataset and visualize it, while continuing to actively participate in the iterative design of Code2Fab.

Shine Resume, SOUNDING.AI — Changsha, CN
Founding Member, Initial start-up team of 5 people — *Apr 2023 – Aug 2023*
As the core founding member, contributed to the forming and growth of the company. Actively participated in the design and iterative development of the "ShineResume". Led the formation and expansion of the AI team, securing partnerships with other companies. Conducted product research and the competitor analysis, and developed product features and AI interactions. Reviewed 1000+ resumes and interviewed 70+ selected candidates. Exited the team upon product launch.

PAST WORKS

A11Y(accessibility) Review | Accessibility, Review, Dataset — West Lafayette, IN
Undergraduate Research Assistant — *May 2023 – Present*
Advisor: Prof. Liang He, CGT@Purdue | Prof. Huaishu Peng, CS@UMD

- Undertook a comprehensive review and analysis of accessibility-related artifacts in top-tier a11y-related conference papers (CHI/ASSETS/UIST) from the past 15 years, aiming to provide a detailed understanding of the design and evaluation patterns in the accessibility domain.
- Summarized the development trend and research mode of papers in the field of accessibility. Compiled a dataset from the reviewed papers, integrating coding criteria to allow exploration and analysis of the accessibility artifacts proposed in these works. Set up a database and visualized the proposed dataset with a dynamical interface.
- Individually designed and developed scripts and MySQL based database, along with specialized annotation tools, to automated the extraction and coding process of relevant papers. In addition, dynamically visualized coded data with interactive interface, enabling in-depth exploration and analysis of over a decade of accessibility research. Reviewed and manually coded 100+ selected papers, resulting in a deep understanding of the accessible artifact field.

Code2Fab | LLM Interface, User Study, Accessibility — West Lafayette, IN
Undergraduate Research Assistant — *Oct 2023 – Present*

Advisor: Prof.Liang He, CGT@Purdue | Prof. Anhong Guo, CSE@UMich; Prof. Angus Forbes, CGT@Purdue

- Addressed the significant barriers faced by BLV users in independently creating and validating 3D models(historically dependent on physical tactile feedback)by leveraging LLM. It enables BLV people through code-based rendering and intelligent assistance, thereby expanding their ability to participate in and benefit from 3D printing technology.
- Transformed the 3D modeling workflow for BLV users by enabling model generation through code or natural language with OpenSCAD. The system supports component selection via hierarchical lists and offers dual interaction modes with natural language or code editing for model modification. Utilized a multi-agent LLM to interpret visual information, manage relative relationships, and facilitate interactive QAs for modifying and verifying models.
- Explored accessible design in WEB development by researching the use of assistive programming tools among low-vision programmers. Introduced Multi-modal LLM to convert visual information into textual formats, facilitating the understanding and modification of existing code for visually impaired users.

Shine Resume | LLM, Human-AI Collaboration, Multi-Agents System   Shenzhen & Changsha, CN
Founding Member, Shine Resume, Initial team of 5 people   *Apr 2023 – Aug 2023*
At that time belonged to: Tanyu.mobi, Sounding.ai was officially registered after my leaving

- Conceptualized and launched 'Shine Resume' from 0 to 1, integrating AIGC and LLM to create a product for undervalued NG that addressed significant gaps of China in the frozen employment market for post-pandemic recovery, attracting external funding of 10M CNY and gaining initial user adoption.
- Developed a comprehensive multi-agent system based on LLM for resume writing, utilizing different agents to meet various requirements(e.g. language style and alignment with facts/JD). The system and its outputs ensure compliance with ethics and Chinese law, integrating multiple sensitive word filtering mechanisms and optimizing both language and output formatting.
- Leveraged advanced NLP models(e.g. BERT) to extract critical keywords from resumes and job descriptions, enhanced vector database retrieval. This innovation bridged the difference between recruitment demands and candidate profiles, ensuring precise alignment of resumes with job specifications.

Mus2Vid | Multi-modal LLM, Music Visualization, User Study   West Lafayette, IN
Research Assistant & Leader   *Mar 2023 – Present*
Advisor: Prof. Yung-hsiang Lu, IEEE Fellow, ECE@Purdue; Prof. Yeon-Ji Yun, Music@Purdue

- Engaged in prototyping and initial user research prior to leading the project, conducted a pilot study of the demo to explore the feedback of AIGC within the music, designed the methods and co-authored the user study. Implemented 1st demo to analyze classical music, capturing emotional and genre-specific characteristics to informs the diffusion model to visually represent the emotions perceived in the music.
- Led the development of 'Mus2Vid', designed recurrent architecture to deal with continuous music output, pioneered in music visualization by iteratively parsing and referencing previous information through regex to solve the problem of consistency and continuity in long video generation.
- The first system integrated narrative story generation with multimodal LLM in music visualization area, based on LLaMA-based multimodal LLM to transform music visualization problems into MV storyboard design. Inspired by the storyboard movie script, the obtained key frames are made into video generation and spliced in hierarchical structure to achieve infinite length video generation and adapt to the needs of music performance in real world.

PROJECTS

ICDGPT: ICD Prediction based on Multi-agents LLM System   Medical LLM for ICD-9 Coding
Fully functional exploration found that this task was temporarily limited by current LLM
Inspired by RecurrentGPT, ICDGPT designed an autoregressive recurrent structure to handle ultra-long texts exceeding 10,000 words. In a single recurrent input module, this system incorporates an updatable memory mechanism and uses a multi-agents debate mechanism to determine ICD-9 codes. By designing multiple conflicting agents, such as insurance and medical personnel, the system aims to reduce hallucinations and emphasize factual accuracy. The system outperforms advanced models like GPT-4 on several metrics, achieving a 15% improvement in F1 and accuracy.

Plug-And-Play Social Robot based on LLM   Grad Course: Assistive Technology
Course Instructor: Byung-Cheol Min, Associate Prof of CIT@Purdue
Developed a modular, multimodal social robot designed to support individuals with depression by processing diverse inputs like voice, facial expressions, and text. The system adapts to user needs with its plug-and-play design and also incorporates LLM to enhance decision-making, ensuring effective support even with expressive limitations.

AWARDS AND SKILLS

Awards: Dean's List and Honor Semester in all semesters, SURF 22', DUIRI 24', Multi semesters' RAship from NSF IIS-2326198, Tencent PM Advanced Camp 24'(Lighthouse Project@Tencent)
Tools: ML - TensorFlow/PyTorch/Pandas/Numpy, PM - such as Figma/Visio, Web - Flask, Vue