ZHENG NING

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RESEARCH AREA

I am an applied scientist focused on designing and deploying human-centered and customer-facing AI systems that address real-world problems. My work integrates both **data-driven** and **human-centered** approaches to build and optimize **machine learning** and **generative** models from data analysis to model training, evaluation and deployment.

Keywords: Human-Computer Interaction, Applied Machine Learning, Generative AI, and Accessibility

EDUCATION

Ph.D. in Computer Science 2021 – 2025
University of Notre Dame, USA
Thesis: Designing Multimodal Human–AI Systems to Augment User Cognitive Capability
Advisor: Toby Jia-Jun Li
Committee: Diego Gomez-Zara, Tingyu Cheng, and Yapeng Tian

B.S. with Distinction in Electrical Engineering 2016 – 2020
University of Electronic Science and Technology of China (UESTC)
Dual degree program with University of Glasgow, UK

PROFESSIONAL EXPERIENCE

Amazon, P13N — Applied Scientist II, Seattle, WA Oct 2025 – Present
Generative recommendation system for products at Amazon homepage.

- Key tech stack: Spark and Pandas for data analysis; PyTorch for model training and LLM fine-tuning; offline LLM-based evaluation for customer intent simulation and labeling etc.

Microsoft Research, EPIC — Internship, Redmond, WA May 2024 – Aug 2024
Generative content repurposing and orchestration for knowledge work.

- Built a research prototype for efficient reuse, transformation, and revision of multimodal content (documents, charts, figures) across apps, devices, and collaborators. Key tech stack: React, LLMs, Stable Diffusion, Segment Anything.

Adobe Research — Seattle, WA May 2023 – Oct 2023
Human–AI collaborative video creation tools.

- *Engineering Intern (Aug 2023 – Oct 2023):* Built LLM-empowered text-based video editing feature in Adobe Premiere Pro (Pr). Collaborated with members across product and research teams. Implemented as an extension inside Pr.
- *Research Intern (May 2023 – Aug 2023):* Built LLM-powered video editing agent to generate rough-cuts from hours of footage while preserving fine-grained user control via direct manipulation (cuts, effects, captions)

SELECTED PROJECTS

Aligning Agentic Workflow with Human Demonstration

- Built a browser-based agentic-workflow system that converts user demonstrations into reusable, editable workflows (visual programming + natural-language prompts). Additionally, finetuned small language models to adapt the LLM to user preferences from a small number of workflow demonstrations. *[Paper]*

Multimodal Assistive Tools for Blind or Low-Vision (BLV) People

- Built AROMA, a mixed-initiative voice assistant for BLV users to complete cooking tasks from video recipes, combining user guidance with multimodal LLM perception to disambiguate steps, track progress, and recover from errors.
- Built SPICA, an interactive video exploration system for BLV users. Augmenting audio descriptions with object-level, spatialized cues and on-demand Q&A without additional human annotation. Allowing BLV users to use both keyboards and touch for navigation and exploration on video content.

Human-AI Collaborative Tools in Videos

- Built MIMOSA, an interactive video editing tool for creating spatial audio effects. Designed an audiovisual ML pipeline with interpretable intermediate outputs enabling users to preview, diagnose, and adjust generated effects.
- Built PEANUT, a human-AI collaborative data annotation tool for video annotation. Designed a ML pipeline using object detection and sound tagging to reduce per-frame manual effort and accelerate data labeling.

SELECTED PUBLICATIONS

[C.8] AROMA: Mixed-Initiative AI Assistance for Non-Visual Cooking by Grounding Multi-modal Information Between Reality and Videos *[Video]*
Zheng Ning, L. Li, D. Killough, J.Y. Seo, P. Carrington, Y. Tian, Y. Zhao, F.M. Li, and T. Li
In Proceedings of the 38th Annual ACM Symposium on User Interface Software and Technology 2025 ***(UIST'25)***

[C.7] Developer Behaviors in Validating and Repairing LLM-Generated Code Using IDE and Eye Tracking
Ningzhi Tang*, Meng Chen*, **Zheng Ning**, Aakash Bansal, Yu Huang, Collin McMillan, and Toby Li
2024 IEEE Symposium on Visual Languages and Human-Centric Computing ***(VL/HCC'24)***

[C.6] PodReels: Human-AI Co-Creation of Video Podcast Teasers *[Video]*
Sitong Wang, **Zheng Ning**, Anh Truong, Mira Dontcheva, Dingzeyu Li, and Lydia B. Chilton
Proceedings of the 2024 ACM Designing Interactive Systems Conference ***(DIS'24)***

[C.5] MIMOSA: Human-AI Co-Creation of Computational Spatial Audio Effects on Videos *[Project]*
Zheng Ning*, Zheng Zhang*, Jerrick Ban, Kaiwen Jiang, Ruohong Gan, Yapeng Tian, and Toby Jia-Jun Li
Proceedings of the 15th Conference on Creativity and Cognition ***(CC'24)***

[C.4] SPICA: Interactive Video Content Exploration through Augmented Audio Descriptions for Blind and Low-Vision Viewers *[Project]*
Zheng Ning, Brianna L. Wimer, Kaiwen Jiang, Keyi Chen, Jerrick Ban, Yapeng Tian, Yuhang Zhao and Toby Li
In Proceedings of the 2024 CHI Conference on Human Factors in Computing Systems ***(CHI'24)***

[T.1] Insights into Natural Language Database Query Errors: From Attention Misalignment to User Handling Strategies
Zheng Ning*, Yuan Tian*, Zheng Zhang, Toby Jia-Jun Li
ACM Transactions on Interactive Intelligent Systems ***(TiiS'24)***

[C.3] PEANUT: A Human-AI Collaborative Tool for Annotating Audio-Visual Data *[Video]*
Zheng Zhang*, **Zheng Ning***, Chenliang Xu, Yapeng Tian and Toby Li
In Proceedings of the 36th Annual ACM Symposium on User Interface Software and Technology 2023 ***(UIST'23)***

[C.2] Interactive Text-to-SQL Generation via Editable Step-by-Step Explanations *[Video]*
Yuan Tian, Zheng Zhang, **Zheng Ning**, Toby Jia-Jun Li, Jonathan K. Kummerfeld, Tianyi Zhang
The 2023 Conference on Empirical Methods in Natural Language Processing ***(EMNLP'23)***

[C.1] An Empirical Study of Model Errors & User Error Discovery and Repair Strategies in Natural Language Database Queries

Zheng Ning*, Zheng Zhang*, Tianyi Sun, Tian Yuan, Tianyi Zhang, and Toby Jia-Jun Li

The 26th International Conference on Intelligent User Interfaces ***(IUI'23)***

MEDIA COVERAGE

Interactive AI Tool Delivers Immersive Video Content to Blind and Low-Vision Viewers

NVIDIA Technical Blog; Generative AI / LLMs; Aug 12, 2024

PROFESSIONAL SERVICE

Member of Program Committee	UIST 2025 (Posters), IUI 2025, ACM Creativity & Cognition 2025
Conference Reviewer	CHI 2024–2026, UIST 2023–2026, CSCW 2024

TEACHING EXPERIENCE

Human-AI Collaborative Systems, Teaching Assistant, Notre Dame CSE 40748	2025
Systems Programming, Teaching Assistant, Notre Dame CSE 20289	2022
Neural Networks, Teaching Assistant, Notre Dame CSE 40868	2022

SKILLS

Programming:	TypeScript, Python, React.js, PyTorch, LangChain, and others
Software:	Figma, Premiere Pro, Photoshop, Tableau
UX Skills:	Experiment Design, Usability Testing, Quantitative Research, Qualitative Analysis