ZHENG NING

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RESEARCH INTEREST

Human-computer Interaction (HCI), Human-AI Interaction, Multi-Modal Interaction, accessibility, and Mixed Reality (MR).

EDUCATION

University of Notre Dame 09/2021 - Present
Ph.D. of Computer Science Notre Dame, IN
- Advisor: Prof. Toby Jia-Jun Li

University of Electronic Science & Technology of China (UESTC) 09/2016 - 06/2020
Bachelor of Electrical and Electronic Engineering Chengdu, China
- Joint education program with University of Glasgow, UK
- Graduated with First-Class honor degree

RESEARCH PROJECTS

Multimodal exploration of video content for Blind and Visual Impairment (BVI) populations 07/2022 - Present
Leading student researcher, Collaborators: Prof. Yuhang Zhao and Prof. Yapeng Tian
- Targeting at developing an accessible tool with various interaction strategies (mouse-keyboard exploration, touch exploration, and mid-air gesture) for BVI population to explore video content and increase immersion while exploring the video.
- Developing an interactive system integrating a visual model for automatically generating audio descriptions for the ”key frames” and objects within the frame. Meanwhile, retrieving the corresponding sound effects of the object in the current frame and plays the sound through spatial audio to increase users’ immersion.
- Conducting usability tests and deployment studies to investigate the effectiveness of the system, compare the disparities among different interaction strategies.

Human-AI co-creation tool for generating and manipulating spatial audio effects for videos 01/2022 - 09/2022
Leading student researcher, Collaborators: Zheng Zhang, Jerrick Ban, and Prof. Yapeng Tian
- Designed and developed a creation tool that enables amateur users to interactively generate and manipulate 3D spatial audio effects in videos that only had monaural or stereo audio.
- Developed a customized plugin that connects our system with Adobe Premiere Pro (Pr) to integrate our tool in the regular video editing process of content creators.
- Designed and conducted a controlled user study of the system, demonstrating that it could support amateur content creators to generate immersive and realistic spatial audio and enable the flexible creation of customized spatial effects.
- Wrote a paper submitted to CHI’23.

Human-in-the-loop data annotation tool for localizing sounding objects in videos 07/2021 - 10/2022
Co-leading student researcher, Collaborators: Zheng Zhang and Prof. Yapeng Tian
- Devised a set of interaction strategies for incorporating partial automation from single-modal AI models into a human-AI collaborative annotation workflow to reduce user efforts in annotating the location of sounding objects in videos.
- Conducted a within-subject user study with 20 participants, showing that the tool can improve the efficiency in the annotation of audio-visual data while also achieving high data accuracy.
- Wrote a paper submitted to CHI’23.

Empirical study on error types and error handling mechanisms in NL2SQL models 09/2021 - 10/2022
Leading student researcher, Collaborators: Zheng Zhang, Tianyi Sun, and Prof. Tianyi Zhang
- Adopted grounded theory approach to code the error types of the state-of-the-art NL2SQL models and developed an error taxonomy that summarizes 48 error types and reveals their distribution patterns.

- Conducted a within-subjects user study with 26 participants to investigate the effectiveness of the three representative interactive mechanisms for error discovery and repair in NL2SQL models.
- Applied statistical tests and visualization approaches to analyze the data of users from using the tested error-handling mechanisms.
- Wrote a paper submitted to IUI'23.

PUBLICATIONS

- **MIMOSA: Human-AI Co-Creation of Computational Spatial Audio Effects on Videos**
  Zheng Ning*, Zheng Zhang*, Jerrick Ban, Kaiwen Jiang, Ruohong Gan, Yapeng Tian, and Toby Jia-Jun Li
  In submission to the ACM Conference on Human Factors in Computing Systems (CHI'23)
- **PEANUT: A Human-AI Collaborative Tool for Annotating Audio-Visual Data**
  Zheng Zhang*, **Zheng Ning***, Chenliang Xu, Yapeng Tian, and Toby Jia-Jun Li
  In submission to the ACM Conference on Human Factors in Computing Systems (CHI'23)
- **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
  In submission to the 26th International Conference on Intelligent User Interfaces (IUI'23)
- **Human-in-the-Loop Generation of Spatial Audio from Videos with Monaural Audio [Paper]**
  Zheng Ning*, Zheng Zhang*, Jerrick Ban, Kaiwen Jiang, Ruohong Gan, Yapeng Tian, and Toby Jia-Jun Li
  ECCV 2022 Workshop on Visual Learning of Sounds in Spaces (ECCV-AV4D)
- **On the Relationship Between Counterfactual Explainer and Recommender [Paper]**
  Gang Liu, Zhihan Zhang, **Zheng Ning**, and Meng Jiang
  KDD 2022 Workshop on Data Science and Artificial Intelligence for Responsible Recommendations (KDD-DS4RRS)

GRANTS & HORNORS

NVIDIA Academic Hardware Grant ($4,650 in equipment)	2022
Outstanding final year project of Glasgow College, UESTC	2020
Outstanding Student Scholarship (three consecutive years), UESTC	2017 - 2019

LANGUAGES & SKILLS

Program Languages:	Python, Pytorch, Javascript, React, Matlab, Tensorflow, SQL, HTML
UX Skills:	Qualitative Research, Quantitative Research, Experiment Design
Softwares:	Tableau, MS Excel, Adobe PS, Adobe Premiere Pro, Adobe Audition, Figma
Languages:	English – Fluent, Chinese (Mandarin) – Native