Chao Zhang

Curriculum Vitae

Zhejiang University, China
Hangzhou, Zhejiang 310058, China

zhangchaohci@gmail.com
https://zhangchaodesign.com/

Research Interests

Digital Youth: I designed interactive technologies to scaffold children in creating, learning, and understanding the world, e.g., AI-fused learning technologies and creativity support tools for children.

Human-AI Collaboration: I explored human-AI collaborative approaches to augment human capabilities of cognition (e.g., creativity, engagement), perception (e.g., observation), and action (e.g., design).

User Experience: I investigated the impact of digital technology on end users in their daily online experience through an ethical and collective lens.

Education

Zhejiang University, Hangzhou, China *09/2020 - 03/2023 (expc.)*

M.E. in Design Engineering

GPA: 95.15/100.00, Rank: 1/60, Advisor: Prof. Cheng Yao

Jiangnan University, Wuxi, China *09/2016 - 07/2020*

B.E. in Electrical Engineering, minor in Digital Media Technology

GPA: 3.83/4.00, Rank: 3/77

Publications

Conference Papers and Posters

c.6. **Chao Zhang**, Cheng Yao, Jiayi Wu, Weijia Lin, Lijuan Liu, Ge Yan, and Fangtian Ying. 2022. StoryDrawer: A Child–AI Collaborative Drawing System to Support Children's Creative Visual Storytelling. In *Proceedings of the 2022 CHI Conference on Human Factors in Computing Systems (CHI '22)*. [pdf]

c.5. Ge Yan, **Chao Zhang**, Jiadi Wang, Zheng Xu, Jianhui Liu, Jintao Nie, Fangtian Ying, and Cheng Yao. 2022. CamFi: An AI-driven and Camera-based System for Assisting Users in Finding Lost Objects in Multi-Person Scenarios. In *Extended Abstracts of the 2021 CHI Conference on Human Factors in Computing Systems (CHI EA' 22)*. [pdf]

c.4. Ge Yan, Cheng Yao, **Chao Zhang**, Jiadi Wang, Yuqi Hu, and Fangtian Ying. 2022. MusicCollage: A Music Composition Tool for Children Based on Synesthesia and a Genetic Algorithm. In *Proceedings of the 2022 International Conference on Human-Computer Interaction (HCII' 22)*. [pdf]

c.3. **Chao Zhang**, Zili Zhou, Jiayi Wu, Yajing Hu, Yaping Shao, Jianhui Liu, Yuqi Hu, Fangtian Ying, and Cheng Yao. 2021. Bio Sketchbook: An AI-assisted Sketching Partner for Children's Biodiversity Observational Learning. In *Extended Abstracts of the 2021 ACM Interaction Design and Children Conference (IDC EA' 21)*. [pdf]

c.2. **Chao Zhang**, Cheng Yao, Jianhui Liu, Zili Zhou, Weilin Zhang, Lijuan Liu, Fangtian Ying, Yijun Zhao, and Guanyun Wang. 2021. StoryDrawer: A Co-Creative Agent Supporting Children's Storytelling through

Collaborative Drawing. In *Extended Abstracts of the 2021 CHI Conference on Human Factors in Computing Systems (CHI EA' 21)*. [pdf]

c.1. Muling Huang, Lingyan Zhang, Lijuan Liu, Pinqi Zhu, **Chao Zhang**, Pitchayapat Sonchaeng, Weiqiang Ying, Pinhao Wang, Yuqi Hu, Fangtian Ying, and Cheng Yao. 2021. ColorGuardian: Customize Skin Tattoos for Children with Vitiligo. In *Extended Abstracts of the 2021 CHI Conference on Human Factors in Computing Systems (CHI EA' 21)*. [pdf]

Journal Articles

j.2. Yang Chen, Katherine Fennedy, Anna Fogel, Shengdong Zhao, **Chao Zhang**, Lijuan Liu, and Chingchiuan Yen. 2022. SSpoon: A Shape-changing Spoon That Optimizes Bite Size for Eating Rate Regulation. *ACM Journal on Interactive, Mobile, Wearable and Ubiquitous Technologies*. 6, 3, 105:1-105:32. [pdf]

j.1. Lijuan Liu, Jiahao Guo, **Chao Zhang**, Zhangzhi Wang, Pinqi Zhu, Tuo Fang, Junwu Wang, Cheng Yao, and Fangtian Ying. 2021. ElectroPaper: Design and Fabrication of Paper-Based Electronic Interfaces for the Water Environment. *Electronics*. 10, 5, 604. [pdf]

Under Review Manuscripts

m.5. Anonymous Authors (**as the First Author**). 2023. Designing an AI-Driven Observational Drawing Tool that Connects Children with Nature [Title modified to ensure blind review]. In *CHI '23. Under Review.*

m.4. Anonymous Authors (**as the Co-First Author**). 2023. Exploring an End-User-Empowerment Intervention Approach for Dark Patterns in UX [Title modified to ensure blind review]. In *CHI '23. Under Review.*

m.3. Anonymous Authors (**as the Second Author**). 2023. Understanding Creators' Engagement with Received Critiques in Online Communities [Title modified to ensure blind review]. In *CHI '23. Under Review.*

m.2. Anonymous Authors (**as the Co-Author**). 2023. Teaching Children Mathematical Language using a Voice-Guided Embodied Game [Title modified to ensure blind review]. In *CHI '23. Under Review.*

m.1. Anonymous Authors (**as the Co-Author**). 2023. Integrating Electronics, Mechanical Structures, and Magnets to Augment Laser-Cut Objects [Title modified to ensure blind review]. In *CHI '23. Under Review.*

Patents & Software Copyrights

Patents

p.4. A Drawing System to Support Children's Observation of Plants and Learning about Biodiversity. 2021. *China National Invention Patent*. Application No. 202110645869.1

p.3. A Sketch Recognition and Generation Method based on Raspberry Pi and Recurrent Neural Network. 2020. *China National Invention Patent*. Application No. 202011322789.4

p.2. A Sentiment Analysis and Visualization Method Combining Video and Pop-Ups. 2019. *China National Invention Patent*. Application No. 201910287517.6

Software Copyrights

sc.1. Enterprise Network Opinion Analysis and Visualization Software. 2019. *China Software Copyright*. Registration No. 2019SR0428088

Selected Design Awards & Exhibitions

Design Awards

a.7. **Iron Award**, A' Design Award, Italy. [Link] *2022*

a.6. **iF Talent Award**, iF Design Award, Germany. [Link] *2021*

a.5. **Honorable Mention**, Design Intelligence Award (DIA), China. [Link] *2021*

a.4. **Outstanding Winner** (Top 1), C4-AI Innovation Contest, China. *2021*

a.3. **Outstanding Winner** (Top 10), China Graduate AI Innovation Competition, China. *2021*

a.2. **Finalist** (Top 20) x 4, User Experience Design Award (UXDA), China. 2021

a.1. **Nominations Award**, International Designer Club Award, Malaysia. *2021*

Design Exhibitions

e.3. **China Design Exhibition**, China. *2022*

e.2. **Global Grad Show** x 2, Dubai Design Week, The United Arab Emirates. [Link.1] [Link.2] *2021*

e.1. **"Ecological Bridge" Innovative Design Exhibition** x 3, China. *2021*

Selected Honors & Scholarships

Honors

h.2. **Valedictorian**, School of IOT, Jiangnan University, China. *2020*

h.1. **Jiangnan Talent** (Only 10 awardees in Jiangnan University), Jiangnan University, China. *2019*

Scholarships

s.3. **National Scholarship** (Top 1% in Zhejiang University), Ministry of Education, China. *2022*

s.2. **National Scholarship** (Top 1% in Zhejiang University), Ministry of Education, China. *2021*

s.1. **National Scholarship** (Top 1% in Jiangnan University), Ministry of Education, China. *2018*

Research Experience

Explore End-User-Empowerment Approach against Dark Patterns in User Experience

SaNDwich Lab, University of Notre Dame (ND), USA *06/2022 - Present*

Lead Researcher, team of 5, advised by Prof. Toby Jia-jun Li and Prof. Yaxing Yao

- Materialized an end-user empowerment intervention approach as a technology probe that supports users in changing dark patterns on website interfaces and designed its interfaces with Figma;
- Implemented the probe in the form of a browser extension using Vue.js, Tailwind CSS, and Google Firebase;
- Conducted a 2-week probe deployment study with 15 participants to understand users' real-life, in-situ reactions to our approach and their underlying needs and preferences;
- Analyzed the collected interview transcripts using thematic analysis and affinity diagramming;
- Submitted a co-first paper to CHI 2023 [m.4.].

Investigate Creators' Engagement with Online Critique

HCI Lab, Hong Kong University of Science and Technology (HKUST), China *06/2022 - 09/2022*

Research Intern, team of 4, advised by Prof. Xiaojuan Ma

- Used pattern.en and NLTK to characterize 287,000 collected comments in online critique communities with content-based features (i.e., actionability, justification, specificity, and valence);
- Developed a coding scheme to characterize seekers' cognitive engagement through thematic analysis;
- Implemented machine learning models (e.g., SVC, MLP, RF, etc.) to classify seekers' cognitive engagement and the creation stages of artifacts (work-in-progress or complete);
- Submitted a second author paper to CHI 2023 [m.3.]

Design an AI Partner to Support Children's Creativity in Visual Storytelling

INNO Lab, Zhejiang University (ZJU), China *10/2020 - 09/2021*

Lead Researcher, team of 5, advised by Prof. Cheng Yao and Prof. Fangtian Ying

- Conducted a formative investigation with 12 parents and 12 children to identify the challenges children face in visual storytelling through semi-structured interviews;
- Designed and developed a child-AI collaborative drawing system that supports children's creativity in visual storytelling using Figma, Vue.js, Paper.js, and Tailwind CSS;
- Implemented a voice agent and a voice-driven sketching algorithm using Baidu Text-to-Speech API, Google Speech-to-Text API, Google Translation API, NLTK, and the Sketch-RNN model;
- Conducted a between-subject user study with 64 children to evaluate our system with mixed methods;
- Published and presented a Late-Breaking Work at CHI 2021 and a first author paper at CHI 2022. [c.2.] [c.6.]

Work Experience

Research Intern, HCI Lab, OPPO Research Institute, China *01/2022 - 04/2022*

Mentored by Dr. Yilei Shi and Dr. Haimo Zhang

Teaching Experience

CST 5141081 Interaction Technology and Design Practice, Teaching Assistant, ZJU *Spring 2021*

CST 5143104 Design Engineering, Teaching Assistant, ZJU *Autumn 2020*

CST 2521018 Frontier of Engineering Technology, Teaching Assistant, ZJU *Autumn 2020*

Oral Presentations

Invited Talk, Design Innovation Center, China Academy of Art *04/2022*

Topic: Entanglement of Design and Technology

Invited Talk, Industrial Design Institution, Chinese Mechanical Engineering Society *04/2022*

Topic: Entanglement of Design and Technology

Presenting Author, CHI 2022, Virtual Event *03/2022*

Presenting Author, IDC 2021, Virtual Event *06/2021*

Presenting Author, CHI 2021, Virtual Event *03/2021*

Academic Services

Paper Reviewing: Chinese CHI 2021, IDC 2022, CHI 2022, ChinaVis 2022, Chinese CHI 2022

Skills

Research: Interview, Survey, Participatory Design, Experimental Design, Thematic Analysis, LaTeX

Design: User Experience Design (Figma, Sketch), 3D Modelling and Rendering (Cinema 4D, Corona Render, Rhino 3D), Generative Design (P5, Processing, Grasshopper), Graphic Design (Adobe Products)

Computing: Front-End Development (Javascript, HTML, CSS, Vue.js), Statistics Analysis (Matplotlib, Numpy, Pandas, SPSS, JASP), and Machine Learning (Sklearn, PyTorch, Tensorflow)

Prototyping: 3D Printing, Laser Cutting, Fabrication and Hardware Assembly, Basic Circuit Design