Chao Zhang

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Research Interests

Digital Youth: Designing 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: Exploring 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: Investigating 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 Industrial Design Engineering

GPA: 95.15/100.00, Rank: 1/60, Advisor: 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.3. Anonymous Authors (**as the 1st author**). 2023. Designing an AI-fused Tool that Supports Children in Observational Drawing and Promotes their Connectedness to Nature [title modified to ensure blind review]. *Under Review at CHI '23*

m.2. Anonymous Authors (**as the co-1st author**). 2023. Design Transparency and End-User Interventions for Dark Patterns [title modified to ensure blind review]. *Under Review at CHI '23*

m.1. Anonymous Authors (**as the 2nd author**). 2023. Understanding Seekers' Engagement with Received Feedback in Online Critique Communities [title modified to ensure blind review]. *Under Review at CHI '23*

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

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

Advisors: Prof. Toby Jia-jun Li and Prof. Yaxing Yao (University of Maryland, Baltimore County)

Topic: explore end-user-empowerment approach to address dark patterns in user experience. [m.2.]

- 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;

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

Advisor: Prof. Xiaojuan Ma

Topic: investigate creators' engagement with received feedback in online critique communities. [m.1.]

- 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);

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

Advisors: Prof. Cheng Yao and Prof. Fangtian Ying

Topic: design creativity support tools for children in visual storytelling. [c.2.] [c.6.]

- 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;

Work Experience

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

Mentors: 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*

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

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, etc.

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

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

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