Chao Zhang

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Research Interests

Human-Computer Interaction; Human-AI Interaction; Human-AI Collaboration; Co-Creativity; Creativity Support Tool; User Experience; Computational Design; Design Tool; Child-AI Interaction; Child-AI Collaboration; Educational Technology; Learning Tools; Digital Sketch; Cognition

Education

Zhejiang University (ZJU), Hangzhou, China — 09/2020 - 03/2023 (expc.)
M.E., Industrial Design Engineering
GPA: 95.15 / 100.00, 1/60, Advisor: Cheng Yao
China National Scholarship (Top 1% nationwide)

Jiangnan University (JNU), Wuxi, China — 09/2016 - 07/2020
B.E., Electrical Engineering
GPA: 3.83 / 4.00, 3/77
China National Scholarship (Top 1% nationwide)

Jiangnan University (JNU), Wuxi, China — 09/2016 - 07/2020
Minor, Digital Media Technology

Publication

Conference Papers

c.1. **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]

Manuscripts

m.3. Anonymous Authors (As the **1st author**). 2023. Observe It, Draw It: An Observational Drawing System that Promotes Children's Connectedness to Nature. *Submitted to **CHI '23***

m.2. Anonymous Authors (As the **co-1st author**). 2023. From Design Transparency to Malleable Interfaces: Exploring End-User Interventions for Dark Patterns in UX. *Submitted to **CHI '23***

m.1. Anonymous Authors (As the **2nd author**). 2023. What Makes Creators Engage with Online Critiques? Understanding the Role of Artifacts' Creation Stage, Characteristics of Community Comments, and their Interactions. *Submitted to **CHI '23***

Journal Papers

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. In *Proceedings of the ACM on Interactive, Mobile, Wearable and Ubiquitous Technologies*. 6, 3 (September 2022), 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 (March 2021), 604. [pdf]

Posters, Extended Abstracts, and Workshop Papers

w.5. 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]

w.4. 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]

w.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]

w.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]

w.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]

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

p.1. Enterprise network opinion analysis and visualization software. 2019. *China Software Copyright*. Registration No. 2019SR0428088

Design Awards and 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

Research Experience

SaNDwich Lab, University of Notre Dame, USA 06/2022 - Present

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

- Proposed a bottom-up end-user-empowerment approach to address dark patterns in UX; designed and developed a technology probe based on Protection Motivation Theory (PMT) and a new Design-Behavior-Outcome framework; designed study protocols for a two-phase co-design study; qualitatively analysed collected data to explore users' underlying needs, preferences, and challenges related to the intervention of UX dark patterns in an everyday setting. [m.2.]

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

Advisor: Xiaojuan Ma

- Used pattern.en and NLTK to characterize the 287k collected comments in online critique communities (OCCs) with content-based features (i.e., actionability, justification, specificity, and valence); constructed a groud-truth dataset and implemented machine learning models (e.g., SVC, MLP, RF, etc.) to classify seekers' creation stages (WIP or complete); developed a coding scheme to characterize OCCs seekers' cognitive engagement. [m.3.]

INNO Lab, Zhejiang University, China 07/2020 - Present

Advisors: Cheng Yao and Fangtian Ying

- Conducted a formative investigation to identify the challenges children face in visual storytelling; iteratively developed a creativity support tool (CST) to scaffold 6-10-year-old children in visual storytelling through child-AI collaboration; proposed two AI-driven collaborative drawing strategies; conducted a 2 × 2 between-subject user study with 64 participants to examine the efficacy of the two proposed collaborative strategies in children's creative performance [w.2.] [c.1.]
- Conducted observational studies and interviews with children to identify their current challenges in nature-based observational drawing; iteratively designed and developed an interactive system leveraging AI and mobile technologies to support children's observational drawing of plants and promote their connectedness to nature; conducted a within-subject in-situ user study with 22 participants to evaluate the efficacy of our system with mixed methods [w.3.] [m.1.]

- Used Grasshopper to develop a design tool based on Rhinoceros 3D software for users to design paper-based electronic prototypes working in water environments; designed 5 applications to demonstrate the efficiency, usability, and functionality of our fabrication approach [j.2.]

Work Experience

Research Intern, HCI Lab, OPPO Research Institute, China 06/2022 - Present
Mentors: Haimo Zhang and Yilei Shi

- Conducted a user elicitation study with 18 participants to gather user-initiated gestures for back-of-device interaction of foldable mobile phones; concluded a four-dimension (context, screen, angle, and gesture) design space. [m.2.]

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 Introduction to the Frontier of Engineering Technology, Teaching Assistant, ZJU Autumn 2020

Oral Presentation

Invited Talk, Design Innovation Center, China Academy of Art, China April 2022
Invited Talk, 21 Design, Industrial Design Institution, Chinese Mechanical Engineering Society, China April 2022
Presenting Author, CHI '22, Virtual Event April 2022
Presenting Author, IDC '21, Virtual Event June 2022
Presenting Author, CHI '21, Virtual Event April 2022

Skills

Language: Native Mandarin, Fluent English (IELTS 7.0)

Research: Statistical Analysis, Semi-Structured Interview, Participatory Design, Design Probe, Thematic Analysis, etc.

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

Computing: Front-End Development (Javascript, HTML, CSS, Vue.js, etc.), Data 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.

References

Cheng Yao, `yaoch@zju.edu.cn`
Associate Professor, College of Computer Science and Technology, Zhejiang University

Xiaojuan Ma, `mxj@cse.ust.hk`
Associate Professor, Department of Computer Science and Engineering, Hong Kong University of Science and Technology

Toby Jia-jun Li, toby.j.li@nd.edu
Assistant Professor, Department of Computer Science and Engineering, University of Notre Dame

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