

# 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

<b>Zhejiang University (ZJU)</b> , Hangzhou, China M.E., Industrial Design Engineering GPA: 95.15 / 100.00, 1/60, Advisor: Cheng Yao <b>China National Scholarship (Top 1% nationwide)</b>	09/2020 - 03/2023 (expc.)
<b>Jiangnan University (JNU)</b> , Wuxi, China B.E., Electrical Engineering GPA: 3.83 / 4.00, 3/77 <b>China National Scholarship (Top 1% nationwide)</b>	09/2016 - 07/2020
<b>Jiangnan University (JNU)</b> , Wuxi, China Minor, Digital Media Technology	09/2016 - 07/2020

## 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

Advisor: Toby Jia-jun Li

- 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 ground-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

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Assistant Professor, Department of Computer Science and Engineering, University of Notre Dame

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