

Yan Xiang

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Research Interests

My broad research interests include **Human-Computer Interaction (HCI)**, **Visualization(VIS)**, **Human-AI Interaction (HAI)**, and their application to multimodal human perception and engagement, extended reality, emotion AI, as well as data-driven approach to human-centered computing and design.

Education

Shanghai Jiao Tong University (SJTU), Shanghai, China Sep. 2021 - Mar. 2024 (Expected)

Master of Engineering in International Industrial Design Engineering (English Program), School of Design.

GPA: 3.92/4.0, Rank: 2/39 (Top 5%), Outstanding Graduate Scholarship (Top 0.5%)

Northeastern University (NEU), Shenyang, China Sep. 2016 - Jun. 2021

Bachelor of Engineering in Architecture, School of Architecture.

GPA: 88.20/100, Rank: 3/66 (Top 5%), Provincial Outstanding Graduate (Top 1%)

Singapore University of Technology and Design (SUTD), Singapore Sep. 2023 - Dec. 2023

Visiting Student, Data-Driven Innovation Lab, Engineering Product Development Pillar

Seoul National University (SNU), Seoul, South Korea Sep. 2018 - Jun. 2019

Exchange student, Architecture, Department of Architecture & Architectural Engineering

GPA: 3.83/4.3 (94.30/100)

Bauhaus-Universität Weimar, Weimar, Germany Jun. 2019 - Aug. 2019

Summer Institute, Architecture and Urbanism

Publications

DIS '23

WiP

Xiang, Y., Fan, Q., Qian, K., Li, J., Tang, Y., & Gao, Z. (2023). "Decentralized Governance for Virtual Community (DeGov4VC): Optimal Policy Design of Human-plant Symbiosis Co-creation." In *DIS'23 Companion: Companion Publication of the 2023 ACM Designing Interactive Systems Conference* (pp.207-212). <https://doi.org/10.1145/3563703.3596621>.

ISTE '22

Xiang, Y., Chang, D., Yao, Y., Wang, L., Chen, A., & Li, J. (2022). "Usability Evaluation of Elder-Friendly Design: Application to Take Alipay App." In *Transdisciplinarity and the Future of Engineering* (pp. 154-163), IOS Press. <https://doi.org/10.3233/ATDE220642>.

IJERPH

Chang, D., **Xiang, Y.**, Zhao, J., Qian, Y., & Li, F. (2022). "Exploration of Brain-Computer Interaction for Supporting Children's Attention Training: A Multimodal Design Based on Attention Network and Gamification Design.", *International Journal of Environmental Research and Public Health*, 19(22), 15046. (SCI, JCR Q1, First student author). <https://doi.org/10.3390/ijerph192215046>.

IEEM '23

Xiang, Y., Chang, D., Feng, X. (2023). "Leveraging Urban Big Data for Informed Business Location Decisions: A Case Study of Starbucks in Tianhe District, Guangzhou City.", In *2023 IEEE International Conference on Industrial Engineering and Engineering Management (IEEM)*, IEEE. (Accepted). <http://arxiv.org/abs/2310.09778>.

IEEM '23

Xiang, Y., Chang, D., Cheng, J. (2023). "Exploring the Correlation between Urban Microclimate Simulation and Urban Morphology: A Case Study in Yeongdeungpo-gu, Seoul.", In *2023 IEEE International Conference on Industrial Engineering and Engineering Management (IEEM)*, IEEE (Accepted). <http://arxiv.org/abs/2310.09779>.

Comput

Educ

Xiang, Y., Zhang, Z., Chang, D., Tu, L. (2023). "The Impact of Gamified Auditory-Verbal Training for Hearing-Challenged Children at Intermediate and Advanced Rehabilitation Stages." *Computers & Education*. (SCI, Under Review). <http://arxiv.org/abs/2310.11047>.

- VIS '23** Chang, D.*, **Xiang, Y.***, Zhu, X. (2023). "A Style Matching Approach for the Generative Design of Animated Posters." In *2023 IEEE Visualization and Visual Analytics (VIS)*. IEEE. (Submitted, *Co-first authors and corresponding author).
- CHI '24** Zhang, J.*, **Xiang, Y.***, Zhao, Y.*, Jin, X., Sun, J., Fan, M., Tong, X., and LC, R. (2024). "From Design Inspiration to Co-curation: The Changing Role of Curatorial Practice in a Digital Generative AI Landscape for the Arts.", In *2024 CHI Conference on Human Factors in Computing Systems* (Submitted, *Co-first authors).
- HRI '24** **Xiang, Y.** "A System Design for Multi-Modal Emotion Regulation and Management in Human-Robot and Human-Computer Interactions." In *2024 19th ACM/IEEE International Conference on Human-Robot Interaction (HRI)*. (Submitted).

Research Experience

Information and Interaction Lab @ School of Design, SJTU

Research Assistant, Advisor: Prof. Danni Chang, Prof. Zhenyu Gu

Sept. 2021 - Present

Brain-Computer Interaction in Children's Attention Training [\[More Details\]](#)

- Developed a multimodal BCI gamification attention training system through real-time EEG command.
- Independently completed the design and development of training game with Unity based on C#.
- Verified by the experiment ($p < 0.05$), the system significantly improves the users' attention behaviors.
- Accepted by *the IJERPH* as the first student author.

Usability Evaluation and Strategy for Elder-Friendly Design [\[More Details\]](#)

- Applied the elder-friendly mode to tackle the accessibility and the usability problem through experiment.
- Analyzed eye movement data, derived design strategies through information architecture, task flow and UI.
- Accepted by *the ISTE '23* Conference, orally presented in MIT, Cambridge, USA.

Auditory-verbal Training System Design for Hearing-impaired Children [\[More Details\]](#)

- Designed gamified training system for children in intermediate and advanced hearing rehabilitation stage.
- Utilized voice and facial mouth shape recognition technology in developing the training system.
- Enhanced the auditory speech rehabilitation training in improving language abilities ($n=31$, $p < 0.05$).

Style Matching Approach for Generative Design of Animated Posters [\[More Details\]](#)

- Applied Kansei Engineering to create a dynamic style labeling dataset by generating and labeling samples.
- Trained a BP neural network and combined genetic algorithm for animated style-matching model.
- Conducted comparative experiments, validated the parametric generation model's validity and usability ($p < 0.05$).

Master's Thesis: Multimodal Emotion System via Brain-Computer Interaction [\[More Details\]](#)

- Developed a multimodal emotion recognition and regulation service system through bio-signal.
- Designed a real-time adjustment model based on brain-computer interaction through EEG signal.
- Verified the effectiveness by conducting experiment with participants in Shanghai Mental Health Center.

Data-Driven Innovation Lab @ Singapore University of Technology and Design

Visiting Student, Advisor: Prof. Jianxi Luo

Sept. 2023 - Jan. 2024 (Expected)

Conceptual Design Generation through Chatbot using LLMs

- Constructed a system and proposed a framework through prompt-based learning using the GPT-4 API
- Designed and developed an empathetic chatbot for engaging user interactions and visualize user status.
- Utilized language inference techniques to generate and enhance users' knowledge systems within the design.

MIT Media Lab-City Science Lab @ Shanghai

Research Assistant, Advisor: Dr. Yan Zhang (Ryan), Prof. Kent Larson

Sept. 2021 - Aug. 2023

Human-AI Co-creation System Design for Decentralized Virtual Community [\[More Details\]](#)

- Proposed decentralized governance for virtual community and designed optimal symbiosis policy.
- Developed a co-creation DAO and evaluated co-design impact through AI agent-based simulation.
- Co-organized the MIT City Science Submit & SocietyDAO workshop as one of the main mentors (1/10).
- Accepted by *the DIS '23* Conference as work in progress as the first author.

Empathetic Messaging- Enhancing Emotional Interaction through Co-Creation

- Investigated how multimodal modes of emotional messages impact users' perception by experiments.
- Proposed effective co-creation methods and tool for empathic communication through AIGC technique.
- Validated that the proposed system facilitates deeper emotional interaction experiences.

Brain Computer Interface Lab @ Rui Jin Hospital Clinical Neuroscience Center & miHoYo
Research Assistant, Advisor: Dr. Odin van der Stelt, Prof. Baoliang LU Oct. 2022 - May 2023

Investigating Digital Therapeutics and Designing PD-CAT for Parkinson's Disease

- Conducted research on digital health products for elderly and designed experimental paradigms.
- Developed a Parkinson's disease cognitive assessment and training tool on mobile and wearable devices.
- Experimentally verified significant improvement in cognitive clinical patient behavior ($p < 0.05$).

HCI-X Summer Research Program @ CityU & DKU & HKUST(GZ)

Summer Research, Advisor: Prof. Ray LC, Prof. Xin Tong, Prof. Mingming Fan June 2023 - Sep. 2023

Exploring Human-AI Co-creation Approach in Digital Space and VR Exhibitions [\[More Details\]](#)

- Interviewed and encoded curators' insights into how the AIGC tool affects the digital curation experience.
- Created a toolkit enabling curators to employ AI tools in different Human-AI co-curation processes.
- Validated the proposed toolkit through experiments and hosted an open virtual exhibition online.
- Submitted to CHI '24 Conference as the co-first author.

Pervasive Human Computer Interaction Lab @ Tsinghua University

Summer Research, Advisor: Prof. Xin Yi, Prof. Yuntao Wang, Prof. Yuanchun Shi May 2023- Sep. 2023

Facilitating Interaction with AIGC Using Proactive Feedback

- Investigated how users perceive and respond to empathetic and unconventional expressions from AI agents.
- Developed proactive feedback mechanism through 8 personality utilizing prompt engineering technology.
- Contrasted experiments on arousal and valence dimensions, revealing improved user emotional engagement.

Teaching Assistantship

User Study international course (taught in English), SJTU, Shanghai, China Sep. 2022 - Jan. 2023

- Conducted instruction classes on data analysis using SPSS and MATLAB to graduate students.
- Assessed and advised weekly assignments for 38 domestic and international graduate students.

Leadership & Innovation

- **Delegate**, Shape Machine Symposium @Georgia Tech & SNU, Seoul, South Korea July 2019
- **Delegate**, ICDF Conference, China-Italy Design Innovation Hub, Tsinghua University Nov. 2021
- **Student Representative**, Roundtable Talk, WDO World Industrial Design Day June 2022
- **Oral speaker**, ISTE Conference, MIT Wong Auditorium, Cambridge, MA, USA July 2022
- **Delegate**, Brain-Computer Interface & Neurotechnology Spring School, IEEE Brain Apr. 2023
- **Founder**, "Neuro-Emotive", Invested by Prof. Zexiang LI (Former Chair of DJI) May 2023 - Present

Exhibitions and Design Works:

- **Independent work**: "Third Space", exhibited in the 2019 Seoul Biennale of Architecture and Urbanism.
- **Independent work**: "Twisting Space", exhibited in World Expo Museum, Shanghai, November, 2022.
- **Independent work**: "Utopia Village", published in: Xiang, Y., Utopia Village, Chinese Creative Design Annual, 2020-2021, pp. 336, <https://doi.org/10.41686/y.cnki.ysjsz.2022.001555>.

Skills

- **Language**: English (proficient), Cantonese (proficient), Mandarin Chinese (native)
- **Experimental skills**: Eye-tracking, and EEG-based brain-computer interface in data processing
- **Professional skills**: Python, Unity3D, C#, React, LaTeX, JavaScript, MATLAB, SPSS, R, Rhino, PS, Pr