

Lei Zhang

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Research Interests

My research focuses on human-computer interaction, specifically on designing and building creativity support tools that enable end-users to create immersive experiences, including Augmented Reality (AR) and Virtual Reality (VR). I invent novel content creation techniques and systems, with the goal of enhancing people's creativity, collaboration, and communication.

Education

- 2018 - 2024
Ann Arbor, MI **University of Michigan, Ann Arbor**
Ph.D. in Information Science
Thesis: *Designing End-user Creation Tools for Immersive Experiences*
Advisors: Steve Oney and Anhong Guo
Committee Members: Anil Çamcı, Andrés Monroy-Hernández, Michael Nebeling
- 2014 - 2018
Shanghai, China **Shanghai Jiao Tong University**
B.Eng. in Software Engineering
Advisor: Xubo Yang

Professional Experience

- 01/2025 - now
Newark, NJ **New Jersey Institute of Technology**
Assistant Professor, Department of Informatics
- 08/2024 -
12/2024
Princeton, NJ **Princeton University**
Postdoctoral Research Associate, Computer Science Department
Host: Andrés Monroy-Hernández
Topic: Block-based programming environments that enable children to create AR experiences [C.9]
- 2018 - 2024
Ann Arbor, MI **University of Michigan, Ann Arbor**
Graduate Student Researcher
- 05/2022 -
08/2022
Santa Monica, CA **Snap Research, Snap Inc.**
Research Intern
Mentors: Andrés Monroy-Hernández, Rajan Vaish
Topic: Authoring immersive storytelling experiences with AR and Internet of Things [C.6]
- 05/2021 -
08/2021
Remote **Snap Research, Snap Inc.**
Research Intern
Mentors: Fannie Liu, Rajan Vaish
Topic: Encouraging effortful communication through handcrafted AR experiences [C.4]

05/2017 - 08/2017 Urbana, IL	University of Illinois Urbana-Champaign Visiting Research Intern Topic: A Gamification Platform for Training Students' Spatial Reasoning Skills [C.1]
2016 - 2018 Shanghai, China	Shanghai Jiao Tong University Undergraduate Research Assistant Advisor: Xubo Yang

Awards and Honors

- 2022 Best Paper Award, ACM CSCW
- 2019 Best Short Paper Award, IEEE VL/HCC
- 2017 Rong Chang Science and Technology Innovation Scholarship, Shanghai Jiao Tong University
- 2017 Academic Excellence Scholarship, Shanghai Jiao Tong University

Peer-Reviewed Conference and Journal Papers

Note: The names of authors who were students at the time of publication are underlined.

Approximate acceptance rates: UIST: 22%, CHI: 23%, VL/HCC: 30%, CSCW: 25%.

- [C.11] Ricardo Mejia Araujo and **Lei Zhang**. ImageDirector: Expressing Spatial Intent via 3D Direct Manipulation for Generative Image Editing. In Proceedings of the 39th Annual ACM Symposium on User Interface Software and Technology (UIST '26). Detroit, MI, USA, 2026.
- [C.10] Zhiyuan (Terry) Wei and **Lei Zhang**. Training Under Pressure: Designing and Evaluating a Multi-Stressor VR Environment for Public Speaking Training. In Proceedings of the 39th Annual ACM Symposium on User Interface Software and Technology (UIST '26). Detroit, MI, USA, 2026.
- [C.9] **Lei Zhang**, Shuyao Zhou, Amna Liaqat, Tinney Mak, Brian Berengard, Emily Qian, and Andrés Monroy-Hernández. Empowering Children to Create AI-Enabled Augmented Reality Experiences. In Proceedings of the 38th Annual ACM Symposium on User Interface Software and Technology (UIST '25). Busan, Korea, 2025.
- [C.8] Yuhan Liu, Emmy Song, Owen Xingjian Zhang, Jewel Merriman, **Lei Zhang**, and Andrés Monroy-Hernández. Understanding Decentralized Social Feed Curation on Mastodon. In Proceedings of the 28th ACM Conference on Computer-Supported Cooperative Work and Social Computing (CSCW '25). Bergen, Norway, 2025.
- [C.7] **Lei Zhang**, Jin Pan, Jacob Gettig, Steve Oney, and Anhong Guo. VRCopilot: Authoring 3D Layouts with Generative AI Models in VR. In Proceedings of the 37th Annual ACM Symposium on User Interface Software and Technology (UIST '24). Pittsburgh, PA, USA, 2024.
- [C.6] **Lei Zhang**, Daekun Kim, Youjean Cho, Ava Robinson, Yu Jiang Tham, Rajan Vaish, and Andrés Monroy-Hernández. 2024. Jigsaw: Authoring Immersive Storytelling Experiences with Augmented Reality and Internet of Things. In Proceedings of the CHI Conference on Human Factors in Computing Systems (CHI '24). Honolulu, Hawaii, USA, 2024.
- [C.5] **Lei Zhang**, Ashutosh Agrawal, Steve Oney, and Anhong Guo. 2023. VRGit: A Version Control System for Collaborative Content Creation in Virtual Reality. In Proceedings of the 2023 CHI Conference on Human Factors in Computing Systems (CHI '23). Article 36, 1–14. Hamburg, Germany, 2023.
- [C.4]  **Lei Zhang***, Tianying Chen*, Olivia Seow*, Tim Chong, Sven Kratz, Yu Jiang Tham, Andrés Monroy-Hernández, Rajan Vaish, and Fannie Liu. 2022. Auggie: Encouraging Effortful Communication through Handcrafted Digital Experiences. In Proceedings of the ACM on Human-Computer Interaction, 6(CSCW2), 1-25. (CSCW '22) **Best Paper Award**

- [C.3] **Lei Zhang** and Steve Oney. 2020. FlowMatic: An Immersive Authoring Tool for Creating Interactive Scenes in Virtual Reality. In Proceedings of the 33rd Annual ACM Symposium on User Interface Software and Technology (UIST '20), pp. 342-353. Virtual, 2020.
- [C.2]  **Lei Zhang** and Steve Oney. Studying the Benefits and Challenges of Immersive Dataflow Programming. In 2019 IEEE Symposium on Visual Languages and Human-Centric Computing (VL/HCC '19), pp. 223-227. Memphis, TN, USA, 2019. **Best Short Paper Award**
- [C.1] Ziang Xiao, Helen Wauck, Zeya Peng, Hanfei Ren, **Lei Zhang**, Shiliang Zuo, Yuqi Yao, and Wai-Tat Fu. 2018. Cubicle: An Adaptive Educational Gaming Platform for Training Spatial Visualization Skills. In 23rd International Conference on Intelligent User Interfaces (IUI '18), pp. 91-101. Association for Computing Machinery, New York, NY, USA, 2018.

Lightly Refereed Workshop Papers

- [W.1] Margherita Andrao, **Lei Zhang**, Lucas Elvira-Martín, Barbara Treccani, Massimo Zancanaro, Paloma Díaz, and Andrea Bellucci. "Understanding Creators Mental Models in Immersive Virtual Reality Programming." In Proceedings of the Workshop on Prototyping and Developing Real-World Applications of Extended Reality at the 17th International Conference on Advanced Visual Interfaces. Genoa, Italy, 2024.

Lightly Refereed Posters, Demos, and Works In Progress

- [P.1] Jad Bendarkawi, Ashley Ponce, Sean Mata, Aminah Aliu, Yuhan Liu, **Lei Zhang**, Amna Liaqat, Varun Rao, and Andrés Monroy-Hernández. 2025. ConversAR: Exploring Embodied LLM-Powered Group Conversations in Augmented Reality for Second Language Learners. In Extended Abstracts of the CHI Conference on Human Factors in Computing Systems (CHI EA '25). *Late Breaking Work*

Dissertation

- [D.1] **Lei Zhang**. Designing End-user Creation Tools for Immersive Experiences. Ph.D. Dissertation. School of Information, University of Michigan. Ann Arbor, MI, 2024.

Grants and Gifts

- | | |
|----------------------|---|
| 2025-2026
\$6,000 | Google Cloud Research Credit Grant: Controllable Spatial Arrangement in Generative Image Editing
PI: Lei Zhang |
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Invited Talks

Towards End-user Creation of Immersive Experiences

- 12/2024 **NeurIPS 2024 Affinity Event: Neurodiversity Workshop**
- 11/2024 **Princeton University**, Guest Lecture
- 10/2024 **University of Rochester**, Guest Lecture

The Democratization of Virtual and Augmented Reality via Content Creation Tools

- 06/2023 **Tsinghua University**, Beijing, China
- 06/2023 **Shanghai Jiao Tong University**, Shanghai, China
- 06/2023 **Hong Kong University of Science and Technology (Guangzhou)**, Guangzhou, China

Academic Service

NSF Review Panel

2026 The Research on Innovative Technologies for Enhanced Learning (RITEL) Program

Program Committee

2027 ACM Conference on Human Factors in Computing Systems (CHI)
 2027 IEEE Conference on Virtual Reality and 3D User Interfaces (VR)
 2026 ACM Conference on Human Factors in Computing Systems (CHI), *Interacting with Devices*
 2025 - 2026 ACM Symposium on User Interface Software & Technology (UIST)
 2025 - 2026 IEEE Symposium on Visual Languages and Human-Centric Computing (VL/HCC)
 2025 The International Conference on Extended Reality (ICXR)

Session Chair

UIST 2025: Creative Design with GenAI
 CHI 2024: Understanding Immersive Experiences

Peer Review

** Recognition for Highly Useful or Outstanding Reviews*

2019 - 2026 ACM Conference on Human Factors in Computing Systems (CHI), 2023*, 2024*
 2020 - 2026 ACM Symposium on User Interface Software & Technology (UIST), 2022*, 2024*, 2025*, 2026*
 2023 - 2024 IEEE Conference on Virtual Reality and 3D User Interfaces (VR)
 2023, 2026 IEEE International Symposium on Mixed and Augmented Reality (ISMAR)
 2022 ACM Conference on Computer-Supported Cooperative Work & Social Computing (CSCW)
 2022 Nordic Conference on Human-Computer Interaction (NodiCHI)
 2021 ACM Symposium on Virtual Reality Software and Technology (VRST)
 2019 ACM Conference on Tangible, Embedded, and Embodied Interaction (TEI)

Student Volunteer

2023 ACM CHI
 2019, 2020 ACM UIST

Other Services

2024 - 2025 HCI Seminar Chair, Computer Science Department, Princeton University
 2023 - 2024 Michigan Interactive and Social Computing (MISC) Student Coordinator, University of Michigan

Teaching Experience

2025 - 2026 IT 487 - Advanced Game Production
 Instructor, New Jersey Institute of Technology

2025 - 2026 IT 201 - Information Design Techniques
 Instructor, New Jersey Institute of Technology

Fall 2023 Introduction to AR/VR
 Graduate Student Instructor, University of Michigan

Fall 2020 Introduction to Programming
 Graduate Student Instructor, University of Michigan

- Winter 2020** **Developing AR/VR Experiences**
Graduate Student Instructor, University of Michigan
- Fall 2019** **Needs Assessment and Usability Evaluation**
Graduate Student Instructor, University of Michigan

Advising and Mentoring

Ph.D. Advisee (Ongoing)

- 2025 - **Zhiyuan (Terry) Wei** (Department of Informatics, NJIT)

Other Mentees

- 2026 **Anhua Wu**, Master's graduate, University of Michigan
- 2026 **Simon Ogorek**, Undergrad, NJIT
- 2025 **Yushan Wei**, Undergrad, University of Michigan
- 2025 **Ricardo Mejia**, Undergrad, NJIT ([C.11])
- 2025 **Abhijeet Sahdev**, Master's student, NJIT
- 2024 **Anny Zhou**, Master's student, Princeton University ([C.9])
- 2024 **Emily Qian**, Undergraduate, Princeton University ([C.9])
- 2024 **Tinney Mak**, Undergraduate, Princeton University ([C.9])
- 2023 **Jacob Gettig**, Undergraduate, University of Michigan ([C.7])
- 2023 **Jin Pan**, Undergraduate, University of Michigan ([C.7])
- 2022 **Ashutosh Agrawal**, Master's student, University of Michigan ([C.5])
- 2022 **Bella Palumbi**, Undergraduate, University of Michigan

Patents

- [PA.11] **Zhang, Lei**, Youjean Cho, Daekun Kim, Ava Robinson, Yu Jiang Tham, Rajan Vaish, and Andrés Monroy-Hernández. "Virtual AR interfaces for controlling IoT devices using mobile device orientation sensors." U.S. Patent Application 17/901,568, filed March 7, 2024.
- [PA.10] **Zhang, Lei**, Daekun Kim, Youjean Cho, Ava Robinson, Yu Jiang Tham, Rajan Vaish, and Andrés Monroy-Hernández. "Authoring tools for creating interactive AR experiences." U.S. Patent Application 17/901,540, filed March 7, 2024.
- [PA.9] **Zhang, Lei**, Ava Robinson, Daekun Kim, Youjean Cho, Yu Jiang Tham, Rajan Vaish, and Andrés Monroy-Hernández. "Recording following behaviors between virtual objects and user avatars in AR experiences." U.S. Patent Application 17/901,611, filed March 7, 2024.
- [PA.8] **Zhang, Lei**, Youjean Cho, Daekun Kim, Ava Robinson, Yu Jiang Tham, Rajan Vaish, and Andrés Monroy-Hernández. "Interaction recording tools for creating interactive AR stories." U.S. Patent Application 17/901,589, filed March 7, 2024.
- [PA.7] Kim, Daekun, **Lei Zhang**, Youjean Cho, Ava Robinson, Yu Jiang Tham, Rajan Vaish, and Andrés Monroy-Hernández. "Co-located full-body gestures." U.S. Patent Application 17/901,483, filed March 7, 2024.
- [PA.6] Kim, Daekun, **Lei Zhang**, Youjean Cho, Ava Robinson, Yu Jiang Tham, Rajan Vaish, and Andrés Monroy-Hernández. "Character and costume assignment for co-located users." U.S. Patent Application 17/901,518, filed March 7, 2024.
- [PA.5] Cho, Youjean, **Lei Zhang**, Daekun Kim, Ava Robinson, Yu Jiang Tham, Rajan Vaish, and Andrés Monroy-Hernández. "Virtual interfaces for controlling IoT devices." U.S. Patent Application 17/901,630, filed March 7, 2024.

- [PA.4] Chen, Tianying, Timothy Chong, Sven Kratz, Fannie Liu, Andrés Monroy-Hernández, Olivia Seow, Yu Jiang Tham, Rajan Vaish, and **Lei Zhang**. "Handcrafted augmented reality effort evidence." U.S. Patent Application 17/888,601, filed March 2, 2023.
- [PA.3] Chen, Tianying, Timothy Chong, Sven Kratz, Fannie Liu, Andrés Monroy-Hernández, Olivia Seow, Yu Jiang Tham, Rajan Vaish, and **Lei Zhang**. "Augmented reality prop interactions." U.S. Patent Application 17/888,948, filed March 2, 2023.
- [PA.2] Chen, Tianying, Timothy Chong, Sven Kratz, Fannie Liu, Andrés Monroy-Hernández, Olivia Seow, Yu Jiang Tham, Rajan Vaish, and **Lei Zhang**. "Handcrafted augmented reality experiences." U.S. Patent Application 17/887,817, filed March 2, 2023.
- [PA.1] Chen, Tianying, Timothy Chong, Sven Kratz, Fannie Liu, Andrés Monroy-Hernández, Olivia Seow, Yu Jiang Tham, Rajan Vaish, and **Lei Zhang**. "Physical action-based augmented reality communication exchanges." U.S. Patent Application 17/887,891, filed March 2, 2023.

Press Coverage

- 12/2025 **New Jersey Institute of Technology News**. "In Augmented Reality Project, a Rodent of Unusual Size Educates Kids"

Last updated: Aug. 1, 2026