

# Chang Xiao

ASSISTANT PROFESSOR · BOSTON UNIVERSITY

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## Research Interests

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My research lies at the intersection of HCI, Generative AI, Computational Design, and AR/VR, focusing on creating transformative technologies and experiences that bridge the digital and physical worlds. I aim to leverage AI and computational methods to enable interactive and engaging platforms that cultivate creativity and empower individuals to effortlessly design immersive experiences.

## Education

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- Columbia University** New York, USA  
PH.D. IN COMPUTER SCIENCE 2016 - 2021
- Thesis: Bridging the Gap Between People, Mobile Devices, and the Physical World
  - Committee: Changxi Zheng (Advisor), Steven K. Feiner (Chair), Brian A. Smith, Carl Vondrick, Andrés Monroy-Hernández
- Zhejiang University** China  
B.S. IN COMPUTER SCIENCE 2012 - 2016
- Chu Kochen Honors College

## Employment

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- Boston University** Boston, USA  
ASSISTANT PROFESSOR 2025 - present
- Adobe Research** San Jose, USA  
RESEARCH SCIENTIST 2021 - 2025
- Presented my research twice at Adobe's annual Summit Sneaks, the company's largest public-facing showcase (**2022, 2024**).
  - Published 10+ papers and filed 6 patents while at Adobe.
  - Mentored 10+ Ph.D. student interns on various research projects.
  - Developing novel AI solutions for Adobe's products.
- Snap Research** New York, USA  
RESEARCH INTERN Summer 2018, 2019
- Mentored by Prof. Shree K. Nayar.
  - Published at SIGGRAPH 2019 and CHI 2021.

## Peer-Reviewed Journal & Conference Publications

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In computer science, conferences are often the primary publication venues. The top conferences in Human-Computer Interaction (e.g., CHI, UIST), Computer Graphics and XR (e.g., SIGGRAPH, SIGGRAPH Asia), and AI/ML (e.g., CVPR, ICCV, NeurIPS, ICLR) are highly selective and widely regarded, with acceptance rates typically ranging from 20% to 25%.

**Bold:** Represents myself. Underline: Represents students or interns I have mentored.

- UIST '25**      ***Streaming, Fast and Slow: Cognitive Load-Aware Streaming for Efficient LLM Serving***  
**Chang Xiao**, Brenda Yang  
ACM Symposium on User Interface Software and Technology, UIST, 2025
- CHI PLAY '25**      ***LLMs May Not Be Human-Level Players, But They Can Be Testers: Measuring Game Difficulty with LLM Agents***  
**Chang Xiao**, Brenda Yang  
ACM The Annual Symposium on Computer-Human Interaction in Play, CHI PLAY, 2025

- CHI '25**      ***Imprinto: Enhancing Infrared Inkjet Watermarking for Human and Machine Perception***  
 Martin Feick, Xuxin Tang, Raul Garcia-Martin, Alexandru Luchianov, Roderick Huang, **Chang Xiao**, Alexa Siu, Mustafa Doga Dogan  
 ACM Conference on Human Factors in Computing Systems, CHI, 2025
- TEI '25** 🏆      ***ReactFold: Towards Camera-based Tangible Interaction on Passive Paper Artifacts***  
**Chang Xiao**  
 ACM Conference on Tangible Embedded and Embodied Interaction, TEI, 2025 (**Best Paper Honorable Mention**)
- SIGGRAPH Asia '24**      ***Evaluating Visual Perception of Object Motion in Dynamic Environments***  
 Budmonde Duinkharjav, Jenna Kang, Gavin S. P. Miller, **Chang Xiao**, Qi Sun  
 ACM Transactions on Graphics (TOG), SIGGRAPH Asia, 2024
- UIST '24**      ***SonifyAR: Context-Aware Sound Effect Generation in Augmented Reality***  
 Xia Su, Jon E. Froehlich, Eunyee Koh, **Chang Xiao**  
 ACM Symposium on User Interface Software and Technology, UIST, 2024
- CHI '24**      ***MoiréWidgets: High-Precision, Passive Tangible Interfaces via Moiré Effect***  
 Daniel Campos Zamora, M. Doga Dogan, Alexa F. Siu, Eunyee Koh, **Chang Xiao**  
 ACM Conference on Human Factors in Computing Systems, CHI, 2024
- CHI '23**      ***Improving Learning-based Camera Pose Estimation for Image-based Augmented Reality Applications***  
 Enyu Cai, Ryan A. Rossi, **Chang Xiao**  
 ACM Conference on Human Factors in Computing Systems, CHI, 2023
- BigData '23**      ***Tabular Data to Image Generation: Benchmark Data, Approaches, and Evaluation***  
 Alex Tang, Gromit Chan, Ryan A Rossi, **Chang Xiao**, Eunyee Koh  
 IEEE International Conference on Big Data, 2023
- WWW '22**      ***VisGNN: Personalized Visualization Recommendation via Graph Neural Networks***  
 Fayokemi Ojo, Ryan A. Rossi, Jane Hoffswell, Shunan Guo, Fan Du, Sungchul Kim, **Chang Xiao**, Eunyee Koh  
 ACM Web Conference, WWW, 2022
- USENIX '22**      ***Can One Hear the Shape of a Neural Network?: Snooping the GPU via Magnetic Side Channel***  
 Henrique Teles Maia, **Chang Xiao**, Dingzeyu Li, Eitan Grinspun, Changxi Zheng  
 USENIX Security, 2022
- UIST '21**      ***MoiréBoard: A Stable, Accurate and Low-cost Camera Tracking Method***  
**Chang Xiao**, Changxi Zheng  
 ACM Symposium on User Interface Software and Technology, UIST, 2021
- ICCV '21**      ***DeepCAD: A Deep Generative Network for Computer-Aided Design Models***  
 Rundi Wu, **Chang Xiao**, Changxi Zheng  
 International Conference on Computer Vision, ICCV, 2021
- CHI '21**      ***BackTrack: 2D Back-of-device Interaction through Front Touchscreen***  
**Chang Xiao**, Karl Bayer, Changxi Zheng, Shree K. Nayar  
 ACM Conference on Human Factors in Computing Systems, CHI, 2021

- CVPR '20**      ***One Man's Trash is Another Man's Treasure: Resisting Adversarial Examples by Adversarial Examples***  
**Chang Xiao**, Changxi Zheng  
 IEEE / CVF Computer Vision and Pattern Recognition, CVPR, 2020
- ICLR '20** 🏆      ***Enhancing Adversarial Defense by k-Winners-Take-All***  
**Chang Xiao**, Peilin Zhong, Changxi Zheng  
 International Conference on Learning Representations, ICLR (Spotlight, top 3%), 2020
- NeurIPS '19**      ***Rethinking Generative Mode Coverage: A Pointwise Guaranteed Approach***  
 Peilin Zhong\*, Yuchen Mo\*, **Chang Xiao\***, Pengyu Cheng, Changxi Zheng  
 (\*equal contribution) Neural Information Processing Systems, NeurIPS, 2019
- SIGGRAPH '19**      ***Widgets: Modular Mechanical Widgets for Mobile Devices***  
**Chang Xiao**, Karl Bayer, Changxi Zheng, Shree K. Nayar  
 ACM Transactions on Graphics, SIGGRAPH, 2019
- TVCG '19**      ***Mechanics-Aware Modeling of Cloth Appearance***  
 Montazerim Zahra, **Chang Xiao**, Raymond Yun Fei, Changxi Zheng, Shuang Zhao  
 IEEE Transactions on Visualization and Computer Graphics, TVCG, 2019
- NeurIPS '18** 🏆      ***BourGAN: Generative Networks with Metric Embeddings***  
**Chang Xiao**, Peilin Zhong, Changxi Zheng  
 Neural Information Processing Systems, NeurIPS (Spotlight, top 3%), 2018
- SIGGRAPH '18**      ***Fontcode: Embedding Information in Text Documents Using Glyph Perturbation***  
**Chang Xiao**, Cheng Zhang, Changxi Zheng  
 ACM Transactions on Graphics, SIGGRAPH, 2018
- CLEO '18**      ***Two-color and 3d Phase-amplitude Modulation Holograms***  
 Adam Overvig, Sajan Shrestha, **Chang Xiao**, Changxi Zheng, Nanfang Yu  
 Conference on Lasers and Electro-Optics, CLEO, 2018

## Peer-Reviewed Workshop & Poster Publications

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- UIST '24**      ***Data Pictorial: Deconstructing Raster Images for Data-Aware Animated Vector Posters***  
 Tongyu Zhou, Gromit Yeuk-Yin Chan, Shunan Guo, Jane Hoffswell, **Chang Xiao**, Victor Soares Bursztyn, Eunye Koh  
 ACM Symposium on User Interface Software and Technology, UIST Poster, 2024
- UIST '23**      ***AutoSurveyGPT: GPT-Enhanced Automated Literature Discovery***  
**Chang Xiao**  
 ACM Symposium on User Interface Software and Technology, UIST Poster, 2023
- CHI '23**      ***StandARone: Infrared-Watermarked Documents as Portable Containers of AR Interaction and Personalization***  
 M. Doga Dogan, Alexa F. Siu, Jennifer Healey, Curtis Wigington, **Chang Xiao**, Tong Sun  
 ACM CHI Conference on Human Factors in Computing Systems (CHI LBW), 2023
- UIST '22**      ***iMarker: Instant and True-to-scale AR with Invisible Markers***  
**Chang Xiao**, Ryan Rossi, Eunye Koh  
 ACM Symposium on User Interface Software and Technology, UIST Poster, 2022

## Honors & Awards

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2025	<b>Best Paper Honorable Mention</b> TEI 2025, 2 out of 141 submissions
2024	<b>Adobe Summit Sneaks Presentation</b> Project Perfect Plays
2022	<b>Adobe Summit Sneaks Presentation</b> Project Right Sized

Adobe Summit Sneaks is a high-profile public event at the annual Adobe Summit, showcasing innovative, experimental technologies that Adobe is exploring. Each year, only 6-7 presentations are selected from hundreds of new inventions at Adobe.

2019-2021	<b>Cheung-Kong Innovation Doctoral Fellowship</b> 2 awardees among Columbia Engineering School.
2022	<b>Snap Research Fellowship</b> 11 awardees worldwide.
4x	<b>Special Recognitions for Outstanding Reviews</b> UIST
2020	<b>ICLR Spotlight Paper</b> Top 3% papers.
2018	<b>NeurIPS Spotlight Paper</b> Top 3% papers.
2019, 2018	<b>NeurIPS Travel Award</b>
2015	<b>China Computer Federation Elite Collegiate Award</b> 20 awardees among all undergrads in China
2014-2016	<b>Zhejiang University First-Class Scholarship</b> 20 awardees among all undergrads in China

## Selected Press

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**Forget touchscreens: This case controls a smartphone with buttons and dials [CNN]**

**Let's Get Personal: The Future of Personalized Digital Experiences in the Era of AI [VLM]**

**Adobe Unveils New Augmented Reality Shopping Tool [Adweek]**

**A new AR-based eCommerce tool by Adobe to help consumers try products virtually [Digital Information World]**

**Magnetic Snoops Plunder Deep Learning's Secrets [Communication of the ACM]**

**Add Scroll Wheels And Buttons To Smartphones With 3D-Printed Widgets [Hackaday]**

**Researchers build a smart case to control your phone with no wires or Bluetooth required [New Atlas]**

**Without Wires Or Bluetooth, This Case Lets You Add Buttons And Scroll Wheels To Your Smartphone [Gizmodo]**

**You Can Send Invisible Messages With Subtle Font Tweaks [WIRED]**

**Hiding Information in Plain Text [IEEE Spectrum]**

**Researchers Hide Information in Plain Text [Columbia Engineering]**

**Helvetica Is Now An Encryption Device [CoDesign]**

**This algorithm can hide secret messages in regular-looking text [Digital Trend]**

**Researchers hide information in plain text [Science Daily]**

## Patents

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### Hypergraph Representation Learning

Ryan Rossi, Ryan Aponte, Shunan Guo, Jane Hoffswell, Nedim Lipka, **Chang Xiao**, Yeuk-Yin Chan, Eunyee Koh

US Patent App. 18/119,305

### Performing Machine Learning Techniques for Hypertext Markup Language-based Style Recommendations

Ryan Rossi, Ryan Aponte, Shunan Guo, Nedim Lipka, Jane Hoffswell, **Chang Xiao**, Eunyee Koh, Yeuk-yin Chan

US Patent App. 17/470,665

### Feature Detection for Image-based Augmented Reality

Enyu Cai, Ryan Rossi, **Chang Xiao**

US Patent App. 18/084,606

## **System and Methods for Providing Invisible Augmented Reality Markers**

**Chang Xiao**, Ryan Rossi, Eunye Koh

US Patent App. 17/882,821

## **Utilizing a Graph Neural Network to Generate Visualization and Attribute Recommendations**

Fayokemi Ojo, Ryan Rossi, Jane Hoffswell, Shunan Guo, Fan Du, Sungchul Kim, **Chang Xiao**, Eunye Koh

US Patent App. 17/654,933

## **Systems and Methods for Steganography Based on Text Fonts**

Changxi Zheng, **Chang Xiao**, Cheng Zhang

US Patent 10,755,375

## **Trackpad on Back Portion of a Device**

Shree K. Nayar, **Chang Xiao**, Changxi Zheng

US Patent 11,550,435

## **Vibrational Input Elements**

**Chang Xiao**, Karl Bayer, Shree K. Nayar, Changxi Zheng

US Patent 11,126,266

## **Professional Services**

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### **Program Committee / Associate Chair**

2025, 2026

**CHI**

2023, 2024, 2025

**UIST**

### **Session Chair**

2024, 2025

**CHI**

### **Reviewer**

2022-

**UIST**

2021-

**CHI**

2020, 2021, 2022

**ICLR**

2020, 2021, 2022, 2023

**CVPR**

2019, 2020, 2021

**NeurIPS**

2019, 2020, 2021

**ICML**

2019, 2020, 2023, 2024

**SIGGRAPH**

2018, 2020

**SIGGRAPH Asia**

2018

**TVCG**

## **Invited Talks**

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**April 2025**

***Bridging the Physical-Digital Divide with Tangible, Ambient and Context-Aware Interaction***

UIUC, Remote Talk

CS Seminar, Hosted by Prof. Tarek Abdelzaher

**Mar 2025**

***Bridging the Physical-Digital Divide with Tangible, Ambient and Context-Aware Interaction***

Boston University, Boston, MA

CS Colloquium, Hosted by Prof. Emily Whiting

**Feb 2025**

***Bridging the Physical-Digital Divide with Tangible, Ambient and Context-Aware Interaction***

University of Utah, Salt Lake City, UT

GAMES Seminar, Hosted by Prof. Shelby Moser

- Mar 2024**                    ***Augmented Interaction Between Physical and Digital World***  
University of Southern California, Los Angeles, CA  
CS Colloquium, Hosted by Prof. Heather Culbertson
- Feb 2024**                    ***Augmented Interaction Between Physical and Digital World***  
Stevens Institute of Technology, Hoboken, NJ  
CS Seminar, Hosted by Prof. Jonggi Hong
- Jan 2024**                    ***Augmented Interaction Between Physical and Digital World***  
Arizona State University, Tempe, AZ  
CS Seminar, Hosted by Prof. Yezhou Yang and Prof. Hasti Seifi
- Nov 2023**                    ***Recent Advances in Input Technologies for Extended Reality (XR)***  
Peking University, Beijing, China  
CS Seminar, Hosted by Prof. Baoquan Chen
- Nov 2022**                    ***Immersive Online Shopping with AR***  
Adobe Tech Summit, San Jose, CA
- Nov 2019**                    ***Interaction through Hidden Channel***  
Zhejiang University, Hangzhou, China  
Seminar, Hosted by Prof. Kun Zhou

## Mentoring

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### ADOBE INTERNS

At Adobe Research, I mentor PhD interns conducting cutting-edge research and publishing in top venues. Listed below are students whom I served as the primary mentor.

- 2025                    **Yunyi Zhu** PhD at MIT
- 2024                    **Yimeng Liu** PhD at UCSB
- 2023                    **Daniel Campos Zamora** PhD at UW
- 2023                    **Monde Duinkharjav** PhD at NYU
- 2023                    **Xia Su** PhD at UW
- 2022                    **Enyu Cai** PhD at Purdue
- 2022                    **Ime Essien** PhD at JHU
- 2022                    **Alex Tang** PhD at Northwestern
- 2022                    **Tongyu Zhou** PhD at Brown

### STUDENTS AT COLUMBIA

- 2020 - 2021            **Rundi Wu** PhD student
- 2020 - 2021            **Yingsi Qin** Undergrad, next: PhD at CMU
- 2019                    **Yihang Yin** Visiting student, next: MS at NUS
- 2019                    **Nanyong Lin** MS student, next: PhD at Yale
- 2018 - 2019            **Yuchen Mo** MS student, next: ByteDance AI Lab
- 2018 - 2019            **Pengyu Chen** MS student, next: Software engineer at Google
- 2018                    **Lahav Lipson** Undergrad, next: PhD at Princeton
- 2018                    **Yuxuan Mei** Undergrad, next: PhD at UW
- 2018                    **Cheng Zhang** MS student, next: PhD at UCI