

# Xincheng Huang

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## RESEARCH STATEMENT

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My research focuses on enhancing the reality and interactivity in AR/VR telepresence. For more realistic telepresence, I explore novel immersive media that promise photo-realistic fidelity, from the more common 360-degree video to the emerging differentiable rendering techniques such as NeRF and Gaussian Splatting. As I adapt them to AR/VR telepresence, I design and create novel interactive techniques that facilitate co-presence and natural collaborative awareness. My research has led to publications at UIST, CHI, Ubicomp, and TVCG. I hope my endeavor will make future telepresence experience more natural, seamless, and enjoyable.

## EDUCATION

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**Doctor of Philosophy in Computer Science** Sept 2021 – present  
University of British Columbia, Vancouver, BC  
*Advisor: Dr. Robert Xiao*

**Master of Science in Computer Science and Engineering** Aug 2019 – April 2021  
University of Michigan, Ann Arbor, MI  
*Advisors: Dr. Nikola Banovic and Dr. Alanson Sample*

**Bachelor of Science in Computer Science** Aug 2015 – May 2019  
New York University Shanghai, China  
*Graduated with Magna Cum Laude, and a secondary major in Interactive Media Arts*

## RESEARCH EXPERIENCE

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**Graduate Research Assistant.** *University of British Columbia, Vancouver, BC* Sept 2021 - present  
*X Lab. Advised by Dr. Robert Xiao*

Enhancing the multi-modal interactivity of remote shared experience in AR/VR. So far, I have contributed to physical surface sharing [3], efficient 360° Video streaming in VR with 5G and Edge-Computing [2], enriched interactivity in remote 360° Video Telepresence [4], and Immersive Telepresence with Gaussian Splatting [7].

**Research Assistant.** *University of Michigan, Ann Arbor, MI* Mar 2020 – April 2021  
*Computational HCI Lab. Advised by Dr. Nikola Banovic and Dr. Alanson Sample*

Conducted a research project as the first author on inferring assembly structures from user behaviors [1]. This work utilized UHF-RFID sensing to profile the movement data of building blocks during assembly tasks, and then inferred the structures being built in real-time given the movement profile with Markov Chain Monte Carlo.

**Research Assistant.** *University of Michigan, Ann Arbor, MI* Jan 2020 – April 2020, Jan 2021 – April 2021  
*Secure Cloud Manufacturing Group. Advised by Dr. Kira Barton*

Created an educational Virtual Manufacture Space in VR for the Detroit Area Pre-college Engineering Program (DAPCEP). Presented two iterations of the project, based on VR and WebGL, on DAPCEP 2020 and DAPCEP 2021.

**Undergraduate Research Assistant.** *New York University, New York City, NY* Jan 2018 – Dec 2018  
*New York University – Guggenheim. Conserving Computer-based Art Initiative. Advised by Prof Deena Engel*

Conducted code analysis for a software-based art: *Color Panel*, by John F. Simon Jr. 1998. Compiled the results of code analysis and suggestions for conservation in a 20-page report archived by the Guggenheim Museum.

## PUBLICATIONS

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### Conference Proceedings (Refereed)

[C.3] Xincheng Huang\*, Dieter Frehlich\*, Ziyi Xia, Peyman Gholami, and Robert Xiao. 2025. GaussianNexus: Room-Scale Real-Time AR/VR Telepresence with Gaussian Splatting. Conditionally Accepted to *The 38<sup>th</sup> Annual ACM Symposium on User Interface Software and Technology (UIST' 25)*. September 28-October 1, 2025, Busan, Korea. ACM, New York, NY, USA, 19 pages. **(Acceptance rate: 22%)**

[C.2] Ziyi Xia, Xincheng Huang, Sidney S Fels, and Robert Xiao. 2025. HaloTouch: Using IR Multi-Path Interference to Support Touch Interactions with General Surfaces. In *Proceedings of the 2025 CHI Conference on Human Factors in Computing Systems (CHI '25)*. Association for Computing Machinery, New York, NY, USA, Article 548, 1–17. <https://doi.org/10.1145/3706598.3714179>. **(Acceptance rate: 24.9%)**

[C.1] Xincheng Huang\*, Michael Yin\*, Ziyi Xia, Robert Xiao. 2024. VirtualNexus: Enhancing 360-Degree Video AR/VR Collaboration with Environment Cutouts and Virtual Replicas. In *The 37th Annual ACM Symposium on User Interface Software and Technology (UIST '24)*, October 13–16, 2024, Pittsburgh, PA, USA. ACM, New York, NY, USA, 12 pages. <https://doi.org/10.1145/3654777.3676377>. **(Acceptance rate: 24%)**

### Journal Articles (Refereed)

[J.4] Bu Li, Xincheng Huang, and Robert Xiao. 2025. VibRing: A Wearable Vibroacoustic Sensor for Single-Handed Gesture Recognition. *Proc. ACM Hum.-Comput. Interact.* 9, 4, Article EICS006 (June 2025), 25 pages. <https://doi.org/10.1145/3733052>.

[J.3] Xincheng Huang and Robert Xiao. 2023. SurfShare: Lightweight Spatially Consistent Physical Surface and Virtual Replica Sharing with Head-mounted Mixed-Reality. *Proc. ACM Interact. Mob. Wearable Ubiquitous Technol.* 7, 4, Article 162 (December 2023), 24 pages. <https://doi.org/10.1145/3631418>.

[J.2] Xincheng Huang, James Riddell, and Robert Xiao. 2023. “Virtual Reality Telepresence: 360-Degree Video Streaming with Edge-Compute Assisted Static Foveated Compression”, in *IEEE Transactions on Visualization and Computer Graphics*, doi: [10.1109/TVCG.2023.3320255](https://doi.org/10.1109/TVCG.2023.3320255). **(Acceptance rate: 20%)**

[J.1] Xincheng Huang, Keylonnie L. Miller, Alanson P. Sample, and Nikola Banovic. 2023. StructureSense: Inferring Constructive Assembly Structures from User Behaviors. *Proc. ACM Interact. Mob. Wearable Ubiquitous Technol.* 6, 4, Article 204 (December 2022), 25 pages. <https://doi.org/10.1145/3570343>.

## TEACHING AND MENTORING

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### Graduate Teaching Assistant

Sept 2022 – Dec 2022

*University of British Columbia, Vancouver, BC*

CPSC 554X – Machine Learning and Signal Processing.

Duties: grading and responding to student questions.

### Learning Assistant

Feb 2019 – May 2019

*New York University Shanghai, Shanghai, China*

CSCI-SHU 101 Introduction to Computer Science.

Duties: holding tutoring office hours, conducting review sessions, and facilitating class activities. Received award for “Excellent Tutoring” and “Most Appointed Office Hour”.

## Undergraduate Mentoring

*At the University of British Columbia (UBC), Vancouver, BC*

Dieter Frehlich, currently working with me

Junkai (Kelvin) Ding, then master's at *the Northeastern University*

James Riddell, then master's at *the University of Waterloo*

*At the University of Michigan (Umich), Ann Arbor, MI*

Keylonnie Miller, undergraduate student at *Umich*, then *Facebook*

## ACADEMIC SERVICE

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**Program Committee:** CHI 2025 Late-Breaking Work

**External Reviewer (36 papers in various journals and conferences)**

UIST 2023, 2025, CHI 2023-2025, IMWUT 2024-2025, IEEEVR 2025, ISMAR 2024-2025, TVCG 2025, SUI 2024-2025, VRST 2024, EICS 2025, CHI Play 2024-2025, IMX 2025

*Received Excellent Review Recognitions for UIST 2025, CHI 2025, CHI Play 2024*

**Student Volunteer:** ISS 2024

## AWARDS

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**MITACS Accelerate**

2023-2024

Conducting Project *Rich, Immersive AR/VR communication* in collaboration with *Rogers Communications Canada Inc.* with a [Mitacs Accelerate](#) award with 60000 CAD.

**Latin Award, Magna Cum Laude**

2019

*Awarded to top 15% of the graduated class at New York University Shanghai*

**Dean's List for Academic Year**

2015 – 2016, 2016 – 2017, 2017 – 2018, 2018 – 2019

*Awarded to top 30% for each academic year at New York University Shanghai*

## LEADERSHIP

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**ENACTUS NYU Shanghai, Vice President**

2016 - 2017

Led the NYU Shanghai's branch of [ENACTUS](#), a world-wide social entrepreneurial student organization. Participated in the user interviews, product design, and prototyping for our project: "A Third Eye: A Digital Blind Crutch". Won the *First prize* and the *Best technology innovation award* in ENACTUS social innovation competition of East China, and an 80000 CNY (~12000 USD) grant from the Chinese Charity Association (Shenzhen).