# Xincheng Huang

Phone: 734-263-4841 | Email: xchuang@cs.ubc.ca | Website: https://xincheng.me


## RESEARCH INTERESTS

My current research focuses on bridging the physical and virtual worlds in remote AR/VR collaboration. To do so, I create novel interactive techniques in Mixed Reality by combining state-of-the-art technologies from machine learning and sensing. From sharing a slice of physical surfaces to fully immersive environments, I hope my endeavor will make future telepresence and remote collaboration more seamless and natural. My research along this target has led to publications to IMWUT, TVCG, and UIST. Recently, I have been trying to incorporate emerging technologies such as neural rendering and generative AI into remote collaboration.

## EDUCATION

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

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

**New York University Shanghai**, Shanghai, China — Aug 2015 – May 2019
B.S. with double major in Computer Science and Interactive Media Arts
*Graduated with Magna Cum Laude*

## RESEARCH EXPERIENCE

**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 explored physical surface sharing and ad-hoc virtual replica creation for remote MR collaboration [J3], and 360° Video VR telepresence with 5G millimeter wave and multi-access edge computing [J2].

**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 [J1]. 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

[C1] 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. (To appear. Access preprint here)

[J3] 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.

[J2] 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.

[J1] 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.

[T2] Zhanghao Chen*, Xincheng Huang*. 2019. 3D Point Cloud Registration Algorithms for the Telewindow. *Undergraduate thesis for Computer Science at New York University Shanghai*. *Advised by Dr. Olivier Marin and Prof. Michael Naimark.*

[T1] Xincheng Huang. 2019. Immersive Strategies: A First-Person Perspective Chess Game in VR. *Undergraduate thesis for Interactive Media Arts at New York University Shanghai*. *Advised by Dr. Alison De Fren.*

(*: equal contribution)

## TEACHING AND MENTORING

**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**
Dieter Frehlich, undergraduate student at *University of British Columbia*
Junkai (Kelvin) Ding, undergraduate student at *University of British Columbia*
James Riddell, undergraduate student at *University of British Columbia*, then M.S. at *University of Waterloo*
Keylonnie Miller, undergraduate student at *University of Michigan*, then *Facebook*

## ACADEMIC SERVICE

**Reviewed 11 papers in various journals and conferences**:
SUI 2024, VRST 2024, CHI Play 2024, IMWUT 2024, ISMAR 2024, CHI 2024, UIST 2023, CHI 2023

## PROFESSIONAL EXPERIENCE

**Assistant Software Engineer**, *PwC Service Deliver Center, Shanghai* July 2018 – Oct 2018
*SAP Department*. Developed SAP-based APIs for financial reports, material, and storage management using ABAP and OpenSQL.

## AWARDS

**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, New York University Shanghai** 2019
*Awarded to top 15% of the graduated class*

**Dean's List for Academic Year, NYU Shanghai** 2015 – 2016, 2016 – 2017, 2017 – 2018, 2018 – 2019
*Awarded to top 30% for each academic year*

**University Recognition Award, NYU Shanghai** 2017 – 2018

## LEADERSHIP

**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* a*ward* in ENACTUS social innovation competition of East China, and an 80000 CNY (~12000 USD) grant from the Chinese Charity Association (Shenzhen).