Xincheng Huang

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RESEARCH INTERESTS

I am interested in enabling novel interactive techniques in Mixed Reality (MR). So far, I have explored sharing physical surfaces and creating virtual replicas for remote MR collaboration [J3], 360° Video VR telepresence with 5G millimeter-wave and edge computing [J2], and tracking assembly tasks (e.g., Lego, furniture) with UHF-RFID sensing and Bayesian inference [J1]. Recently, I am trying to enhance the immersion, reality, and interactivity of mixed-reality remote collaboration with the emerging machine learning technologies such as Neural Radiance Field, 3D diffusion, and LLMs.

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

[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.* (*equal contribution)

[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.*

TEACHING

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".

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.

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).

ACADEMIC SERVICE

Reviewer, CHI 2024, UIST 2023, CHI 2023

AWARDS

MITACS Accelerate 2023

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