Max Chen

Known Alias: Jingru Chen | Email: mjchen@wpi.edu | Website: https://users.wpi.edu/~mjchen
(Last Update: 6/24/2024)

EDUCATION

PhD in Computational Media   Aug 2022 - Present
Worcester Polytechnic Institute (WPI), Worcester, MA
Advisors: Prof. Gillian Smith and Prof. Erin Solovey

Master of Science in Interactive Media & Game Development   Aug 2020 – Dec 2022
Worcester Polytechnic Institute (WPI), Worcester, MA
Advisors: Prof. Gillian Smith and Prof. Erin Solovey

Bachelor of Engineering in Pharmaceutical Engineering   Aug 2016 – June 2020
Wuhan University of Technology, Wuhan, China

RELEVANT SKILLS AND COURSEWORK

Programming: C#, Python, MATLAB, Java, HTML/CSS/JavaScript, C++

Software and Tools: Unity, Unreal, GitHub, Plastic SCM, Unity Cloud, Adobe Creative Suite, Figma, Qualtrics, Aurora (NIRx), Turbo Satori (NIRx)

Courses: Tangible and Embodied Interaction, Brain-Computer Interaction, Design of Interactive Experiences, Multidisciplinary Research Methods in Computational Media, System Dynamics, Learning Sciences

PUBLICATIONS

Journal Article

[J1] **Max Chen**, Yichen Li, Hilson Shrestha, Noëlle Rakotondravony, Andrew Teixeira, Lane Harrison, and Robert E. Dempski. 2024. FlowAR: A Mixed Reality Program to Introduce Continuous Flow Concepts. Journal of Chemical Education 101, 5: 1865–1874. https://doi.org/10.1021/acs.jchemed.3c00807

Conference Articles

[C6] **Max Chen** and Gillian Smith. 2024. Game Development as Project-Based Learning: Synthesizing Postmortems of Student-Created Mobile Games. Foundations of Digital Games (FDG '24)

[C5] **Max Chen**, Dashiell Elliott, Robert Dempski and Raúl Orduña Picón. 2024. Designing Interactive Virtual Tours for Education: Two Case Studies on Virtual Tours of the Chemistry and Biochemistry Laboratories. Foundations of Digital Games (FDG '24)

[C4] **Max Chen**, Shano Liang, and Gillian Smith. 2023. Stackable Music: A Marker-Based Augmented Reality Music Synthesis Game. In Companion Proceedings of the Annual Symposium on Computer-Human Interaction in Play (CHI PLAY Companion '23). Association for Computing Machinery, New York, NY, USA, 22–28. https://doi.org/10.1145/3573382.3616071

[C3] **Max Chen**, Yihong Xu, Alexander Sirois, Yichen Li, Robert Dempski, Gillian Smith, Yuko Oda, Yunus Telliel, Erika

S. Lewis, and Kelilah L. Wolkowicz. 2023. WheelUp! Developing an Interactive Electric-power Wheelchair Virtual Training Environment. In 2023 IEEE Conference on Games (CoG), 1–6. https://doi.org/10.1109/CoG57401.2023.10333203

[C2] **Max Chen**, Erin Solovey, and Gillian Smith. 2023. Impact of BCI-Informed Visual Effect Adaptation in a Walking Simulator. In Proceedings of the 18th International Conference on the Foundations of Digital Games (FDG '23). Association for Computing Machinery, New York, NY, USA, Article 5, 1–8. https://doi.org/10.1145/3582437.3582448

[C1] **Max Chen** and Shamsnaz Virani Bhada. 2022. Converting natural language policy article into MBSE model. INCOSE International Symposium 32, S2: 73–81. https://doi.org/10.1002/iis2.12897

Presentations

[P4] Shano Liang, **Max Chen**, Phoebe Toups Dugas, Gillian Smith and Rose Bohrer. Exploring the Complexity of Jubensha: A Taxonomy and Analysis of Chinese Murder Mystery Role-Playing Games. Foundations of Digital Games (FDG '24), Worcester, MA, USA, May 2024

[P3] Robert Dempski, Claire Li, **Max Chen**, Shano Liang. Integrating Biophysics Immersive Learning Tools Across Campus. Building a Network of Biophysics Education, Virtual, June 2022

[P2] Robert Dempski, Andrew Texeira, Claire Li, Shano Liang, **Max Chen**. Integrating Immersive Learning Tools across Campus and Beyond. Advanced Manufacturing and Processing Conference, Washington DC, June 2022

[P1] **Max Chen**. The Importation of Murder Mystery Games in China – Game Localization and Creativity. Canadian Game Studies Association Annual Conference, June 2022

Invited Talks

[T3] Massachusetts College of Art and Design Artward Bound Program, "Implementing Augmented Reality to Emphasize the Impact of Climate Change" (2022)

[T2] "Number Systems". Girls Talk Math, WPI Chapter (2023)

[T1] "Designing Exergames: Impact of Immersive Experience Beyond Engagement and Motivation". IEEE VR 2023 Workshop on VR for Exergaming (VR4Exergame 2023)

PROFESSIONAL EXPERIENCE

Graduate Assistant, Massachusetts Digital Games Institute (MassDigi), WPI , MA
June 2024 – Present
- Mentored 40-50 students across 7 teams in creating mobile games during MassDigi's Summer Innovation Program (a professionalization program aimed at early-stage developers and college students in game development).
- Provided guidance on game design, development processes, and project management.

Research Intern, The Roux Institute, Northeastern University, Portland, ME
June 2023 – Aug 2023
- Conducted research using Emotibit and Empatica E4 to evaluate emotional responses in various VR settings.

Research Assistant, WPI Academic & Research Computing, Worcester, MA
February 2021 - Present
- Provided AR/VR training & technical consultation to students and faculties.
- Prototyped AR/VR application to meet diverse academic needs.
- Wrote and maintained documentation on equipment.

Senior Member, WPI Intentional Design Studio, Worcester, MA
September 2020 - Present
- Supervised student teams working on websites, VR/AR apps, and educational games from ideation to maintenance.
- Provided mentorship and technical support to students, fostering a collaborative and innovative environment.
- Organized and led workshops and training sessions on best practices in design and development.

AWARDS, GRANTS, AND FUNDING

- WPI Teaching Assistant (2023-2025): Annual $29,250 + course credits
- WPI Graduate Student Travel Award (2023): $500
- Foundations of Digital Games Travel Assistance Program (2023): $900
- Supporting WPI Women in STEM Education Research (2023): $11,478
- Third Place, WPI 14th Annual Sustainability Project Competition (2022): $500
- Mentor, Women in Research and Mentorship Program (2022): $1,500

PROJECTS

AR/VR for Education

WheelUp: Co-design a VR Wheelchair Simulator
September 2022 – September 2023
This project builds the bridge between developers and user community. We developed a VR wheelchair simulator to train users in driving electric wheelchair using various input mechanics in a safe environment. The work-in-progress paper was published and presented at CoG 2023, and we were interviewed by WPI News.

Flow Chemistry AR
September 2020 – March 2023
This project involves the development of a HoloLens AR application to instruct on packed bed column assembly and assess its effectiveness in a flow chemistry laboratory session. The research paper is published and featured as cover image of Journal of Chemical Education.

Project-based Learning

Pedagogy Research on Game Development Program
August 2023 - Present
This project investigates the instructional strategies in game development programs at the undergraduate and high school levels. The primary aim is to identify best practices in teaching and evaluating game design and development, with a focus on fostering creativity, technical skills, and teamwork among students. The research paper is published and presented at FDG 2024.

Novel Inputs for Video Games

Stack AR: Transparent AR Marker
March 2022 – September 2023
This project investigates the design affordances of transparent film paper for marker-based AR. The goal is to create AR-based learning tools. The work-in-progress paper was published and presented at CHI PLAY 2023.

BCI-informed Game Visuals (MS Thesis)
October 2021 - December 2022
This project aims to explore the use of brain-computer interface (BCI)-adapted visual effects to support atmosphere in a walking simulator game and investigated its impact on player-reported immersive experience. I developed an open-sourced interface from fNIRS acquisition to Unity3D. The research paper is published and presented at FDG 2023.

SERVICES

Reviewer

2024	The Annual Symposium on Computer-Human Interaction in Play (CHI PLAY)
2024	International Conference on Foundations of Digital Games (FDG)
2023	IEEE Conference on Games (CoG)
2023	CHI Conference on Human Factors in Computing Systems (CHI)

Conference Organization Committee

| 2024 | Local Chair of the Foundations of Digital Games (FDG '24) |

Other

2023 – 2025	Graduate Student Representative for IMGD Graduate Program Committee
2023 – 2025	Graduate Student Representative for IMGD Department Committee
2023	Workshop Organizer, Women in STEM Conference
2022	Workshop Organizer, Latino Education Institute, Worcester State University

TEACHING AND MENTORING EXPERIENCE

Undergraduate Mentoring - Major Qualifying Project

| 2024 | Jagger Polvino, James Cao, Andrew Nguyen. "Developing a Brain-Computer Interface to Enhance Storytelling in Games with the Identification of Cognitive States" |
| 2023 | Amanda Jones, Megan Letendre, Elise Nerden. "Sewn into Memory: Reliving Feelings through an AR Quilt" |

Undergraduate Mentoring – Summer

2024	Fiona Prendergast
2023	Reilly Desai
2022	Amanda Jones

Undergraduate Mentoring

| 2024 | Dashiell Elliott, co-published "Designing Interactive Virtual Tours for Education: Two Case Studies on Virtual Tours of the Chemistry and Biochemistry Laboratories" |
| 2022 | Yihong Xu, co-published "WheelUp! Developing an Interactive Electric-power Wheelchair Virtual Training Environment" |

Women's Research and Mentorship Program (WRAMP)

| 2022 | Rachel Foye, Ava Stockton, and Dinah Agyemang. "Food Chain AR: Co-design an Augmented Reality Book with Educators and Students" |

Guest Lectures

| 2024 | WPI CS 525 / NEU 505 Special Topics in Computer Science: Brain-Computer Interaction (graduate) "Brain-computer Interfaces and Games" |
| 2023 | WPI IMGD 3100: Novel Interfaces for Interactive Environment, "Brain-computer Interfaces and Games" |