

Max Chen

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RESEARCH INTERESTS

I am a PhD student in Interactive Media and Game Development at Worcester Polytechnic Institute, where I am a member of Crafting Computational Crafting Lab, [Intentional Design Studio](#), and [HCI Lab](#). My research focuses on computational design, with a particular emphasis on developing novel interfaces for immersive environments such as video games, virtual reality, and augmented reality. Particularly, I am interested in exploring design strategies that leverage biofeedback and neurofeedback to enhance user experiences in video games. As a research assistant at WPI Academic & Research Computing, I develop, implement, and evaluate digital media products that support and promote faculty research, teaching, scholarship, and external partnerships.

EDUCATION

PhD in Computational Media Worcester Polytechnic Institute (WPI), Worcester, MA Advisors: Prof. Gillian Smith and Prof. Erin Solovey	Aug 2022 - Present
Master of Science in Interactive Media & Game Development Worcester Polytechnic Institute (WPI), Worcester, MA Advisors: Prof. Gillian Smith and Prof. Erin Solovey	Aug 2020 – Dec 2022
Bachelor of Engineering in Pharmaceutical Engineering Wuhan University of Technology, Wuhan, China	Aug 2016 – June 2020

RELEVANT SKILLS AND COURSEWORK

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

Software and Tools: Unity3D, Unreal Engine, GitHub, Plastic, Adobe Creative Suite, Qualtrics, 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

- **Max Chen**, Yichen Li, Hilson Shrestha, Noëlle Rakotondravony, Lane Harrison, Robert E. Dempski, *FlowAR: An effective mixed reality program to introduce continuous flow concepts*. [Manuscript under review]

CONFERENCE PAPERS

- **Max Chen**, Shano Liang, Gillian Smith. *Stackable Music: A Marker-Based Augmented Reality Music Synthesis Game*. The Annual Symposium on Computer-Human Interaction in Play (CHI PLAY '23). Stratford, Canada, October 2023 [Accepted]
- **Max Chen**, Yihong Xu, Alexander Sirois, Yichen Li, Robert Dempski, Gillian Smith, Yuko Oda, Yunus Telli, Erika

Lewis, Kelilah Wolkowicz, *WheelUp! Developing an Interactive Electric-power Wheelchair Virtual Training Environment*. IEEE Conference on Games (CoG '23). Boston, USA, August 2023

- **Max Chen**, Erin Solovey, Gillian Smith. *Impact of BCI-Informed Visual Effect Adaptation in a Walking Simulator*. Proceedings of the 18th International Conference on the Foundations of Digital Games (FDG '23). Lisbon, Portugal, April 2023
- **Max Chen** and Shamsnaz Virani Bhada. *Converting Natural Language Policy Article into MBSE Model*. INCOSE International Symposium. Vol. 32. 2022.

PRESENTATIONS

- Robert Dempski, Claire Li, **Max Chen**, Shano Liang. *Integrating Biophysics Immersive Learning Tools Across Campus*. Building a Network of Biophysics Education, Virtual, June 2022
- 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
- **Max Chen**. *The Importation of Murder Mystery Games in China – Game Localization and Creativity*. Canadian Game Studies Association Annual Conference, June 2022

INVITED TALK

- IEEE VR 2023 Workshop on VR for Exergaming (VR4Exergame)

PROFESSIONAL EXPERIENCE

Research Intern, The Roux Institute at Northeastern University, Portland, ME June 2023 - Present
I conduct research in using biometric sensors for evaluating emotional responses.

Research Assistant, WPI Academic & Research Computing, Worcester, MA Feb 2021 - Present
I provide AR/VR training & technical expertise to students and faculties, prototype AR/VR and other educational technologies for various needs. I write and maintain intuitive and accessible documentation on equipment (HoloLens 2, Quest 2, Matterport), and maintain internal websites for demonstrating showcases.

Senior Member, WPI Intentional Design Studio, Worcester, MA Sep 2020 - Present
I develop VR/AR apps, from design to maintenance phase, working on teams of 3-6 programmers, designers, and artists. Our collaborators and clients are from WPI, Delsys Technology, UMass Lowell, Doherty Memorial High School, etc.

AWARDS & GRANTS

- 2023 Graduate Student Travel Award
- 2023 Foundations of Digital Games Travel Assistance Program (TAP)
- 2023 Supporting WPI Women in STEM Education Research
- 2022 Third Place in WPI 14th Annual Sustainability Project Competition
- 2022 Mentor, Women in Research and Mentorship Program

PROJECTS

Stack AR

Sep 2022 - Present

This project investigated the design affordances of transparent film paper and how it can be used in augmented reality (AR). We apply participatory design framework in creating AR-based learning tools with educators, students and learning scientists.

WheelUp: Co-design a VR Wheelchair Simulator

Sep 2022 - Present

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.

Flow Chemistry AR

Sep 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.

BCI-informed Game Visuals (MS Thesis)

Oct 2021 - Dec 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 functional near-infrared spectroscopy (fNIRS) acquisition and processing tool to Unity3D.

VOLUNTEER/SERVICES

- Graduate Student Representative for IMGD Graduate Program Committee (2023)
- Graduate Student Representative for IMGD Department Committee (2023)
- Graduate Student Union Member (2022)
- Workshop Mentor at Latino Education Institute, Worcester State University (November 2022)

TEACHING/MENTORING EXPERIENCE

Undergraduate Major Qualifying Project

- Amanda Jones, Megan Letendre, Elise Nerden. “Sewn into Memory: Reliving Feelings through an AR Quilt” (2023)

Women’s Research and Mentorship Program

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

Guest Lectures

- WPI IMGD 3100: Novel Interfaces for Interactive Environment, “Brain-computer Interfaces and Games” (2023)
- Massachusetts College of Art and Design Artward Bound Program, “Implementing Augmented Reality to Emphasize the Impact of Climate Change” (2022)
- Girls Talk Math, “Number Systems” (2023)