

ZHAORUI (JAYSON) ZHANG

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EDUCATION

Northeastern University — Boston, MA

August 2021 - April 2025

Bachelor of Science in Computer Science & Game Development (Expected April 2025)

- **GPA:** 3.913 / 4.0
- **Honor:** Dean's List (Four Semesters)
- **Computer Science Core Courses:**
- Programming in C++, Game Programming, Object-Oriented Design, Computer Systems, Networks & Distributed System, Computer Graphics, Human Computer Interaction, Algorithms & Data, Fundamentals of Software Engineering, Building Game Engines
- **Game Development Core Courses:**
- Rapid Idea Prototyping Games, Game Concept Development, Level Design and Game Architecture, Game Design Capstone

INTERNSHIP EXPERIENCE

Xellar Biosystems

Boston, MA

Backend Engineer Intern

May 2024 - August 2024

- Designed and implemented a PostgreSQL-based database and created an entity-relationship diagram (ERD) to structure experimental data and medical images stored in a cloud-based object storage service (Linux-based).
- Developed a 2D Z-layer stacking cell browser using Django (backend) and React (frontend) for precise viewing and analysis of cell images across different Z-axis planes.
- Utilized VTK (Visualization Toolkit) to develop a 3D volume rendering viewer, enabling visualization and interactive manipulation of complex 3D data sets.

Beijing Lenovo Hyperconverged Technology Co., Ltd.

Beijing, China

Documentation Development Engineer

September 2024 - December 2024

- Designed and created a Sphinx multi-document project, with ReStructuredText as the markup language to document a new system version based on Red Hat Enterprise Linux 8 (RHEL 8).
- Developed a master directory project to link individual documents into a cohesive documentation structure, supporting inter-document references for better navigation.
- Enhanced document interactivity and user experience by customizing themes, CSS files, and utilizing Sphinx plugins, to ensure the visual presentation and usability of documentation.
- Optimized HTML documentation for conversion into PDF format and achieve cross-platform compatible.
- Supported automation of documentation generation and publication by configuring CI/CD pipelines, ensuring seamless updates with system code changes.

RESEARCH EXPERIENCE

Algorithm for Game Design

March 2024 - September 2024

Group Leader; Supervisor: William Nace

- Completed an advanced course on game design algorithms, covering maze generation, collision detection, 3D rendering, multiplayer synchronization, and optimization techniques.
- Led a team of four members to make an in-depth literature review on fluid simulation methods for video games, focusing on balancing real-time performance and visual accuracy.
- Explored and compared four key methodologies: DCGrid, ISPH vs. WCSPH, IISPH, and the Finite Volume Method, and analyzed their strengths, limitations, and applicability in diverse gaming scenarios.

- Synthesized fundamental principles such as the Eulerian and Lagrangian viewpoints and Navier-Stokes equations to provide a foundation for understanding simulation techniques in game development.
- Publication: Zhaorui Zhang, Yongzhi Zhuang, Yiqun Zhong, Bowen Chen. *Fluid Dynamics for Games*. International Conference on Computing Innovation and Applied Physics (Accepted).

SELECTED COURSE PROJECTS

Echoes of the Labyrinth | C++/OpenGL/SDL | Game Engine Engineer *January 2024 – May 2024*

- Mastered rendering graphics libraries based on OpenGL and SDL, managing the rendering pipeline and writing shaders.
- Implemented core game functionalities including map and model loading, player movement, collision detection, and audio triggers.

Java Journal | Java/CSS | Software Development Engineer *June 2023 – August 2023*

- Led the project as the primary manager, overseeing and assigning tasks for the Model-View-Controller (MVC) architecture components.
- Developed Java backend, focusing on data processing and integration with frontend components.
- Implemented a secure user authentication system to ensure privacy and data integrity.
- Utilized CSS to develop dynamic, responsive pages, optimizing usability and user experience.

Guardian Breakout | Unity/C# | Game Development Engineer *January 2023 – June 2023*

- Initiated the project, conceptualizing and designing the core gameplay mechanics.
- Acted as the lead programmer, responsible for writing and maintaining core game scripts, including player movement, attack dynamics, collision detection, inventory management, character animations, and basic game functionality.

The Little Boy: Quei | Unity/C# | Game Development Engineer *January 2023 – June 2023*

- Led the creation and ongoing maintenance of game scripts, focusing on player movement, collision detection, and basic game mechanics.
- Coordinated the integration between the game engine and underlying codebase, ensuring smooth animation and interaction between game systems.

PROFESSIONAL SKILLS

Programming Languages: C# (tens of thousands of lines of code), C++ (tens of thousands of lines of code), Java (tens of thousands of lines of code), C, Python, JavaScript, SQL, CSS, HTML

Game Development Engines: Unity, Unreal Engine, RPG Maker, Godot

Code Editors/IDEs: Visual Studio Code, Visual Studio, Git, IntelliJ, PyCharm, Eclipse

Libraries/APIs: OpenGL, Simple DirectMedia Layer (SDL), WebGL, Django, React, VTK, PostgreSQL, Sphinx
 Proficient in game design with extensive experience in Unity, having completed 3-5 independent game projects, including an award-winning game.

Demonstrated expertise in shader programming and graphical rendering using OpenGL and SDL, showed through a developed game demo.

OTHER INFORMATION

Hidden Hero Jam — *Global Game Development Challenge (March 20, 2023)*

- Independently responsible for all aspects of program development.
- Placed 7th out of 33 teams in Visual Effects and Sound Design.
- Also ranked 7th in Story Design and Immersion for creativity and narrative depth.

Languages: Chinese (Native); English (Proficient)

Interests: Tabletop Role-Playing Games (TTRPGs) such as Dungeons & Dragons and Call of Cthulhu.

Passionate about Metroidvania video games, especially titles like *Hollow Knight* and *Blasphemous*.