

# XINYI JOYCE ZHOU

95 Flamingo Bay Dr, Missouri City,  
Texas 77459

(346)-552-2403  
jowiece844240@gmail.com

Portfolio: joycethecreator.github.io  
www.linkedin.com/in/xinyi-joyce-zhou

## EDUCATION

Purdue University

Master of Science in Computer Graphics Technology

Bachelor of Science in Computer Science / Bachelor of Art in Film and Theater Production

West Lafayette, IN

Aug 2024, GPA: 4.00/4.0

May 2022, GPA: 3.73/4.0

**Selected Relevant Coursework:** Linear Algebra, Calculus, Object-Oriented Programming, Programming In C, Data Structure, Algorithm Analysis, VR&AR, Interactive and Real-Time Computer Graphics, Scientific Visualization, Compute Shader Programming, Virtual Environments, Procedural Content Generation for Games; Screenwriting, Video Editing, Light Design/Technology, Live Events & Sports Video, Cinematography & Videography.

## SKILLS

**Programming:** C, C++, C#, Java, Python

**Graphics APIs & Tools:** OpenGL, GLSL, Unity, VTK, Compute Shaders, MATLAB, R,

**Postproduction Tools:** Davinci Resolve, Adobe Premiere Pro, Adobe After Effects

## EXPERIENCE

**Blinn College: Instructor, Computer Science and Game and Simulation Programming**

Jan 2025 – Present

- Designed and taught undergraduate curriculum in **game development** and **real-time computer graphics**, covering the graphics pipeline, lighting models, ray tracing, shader programming, and modern graphics APIs including **OpenGL** and **GLSL** using **C/C++**.
- Led hands-on programming labs in **C**, **C++**, and **Python (Pygame)**, mentoring students in **object-oriented design**, game loop architecture, performance profiling, memory management, and industry-standard debugging.

**Purdue Envision Center: Unity Programmer/Research Assistant**

Mar 2021 – May 2024

- Specialized in developing real-time simulations and toolsets using **Unity**, with a focus on multi-platform development including web, Virtual Reality (VR), Augmented Reality (AR), mobile, and standalone systems.
- Engage in collaborative efforts with cross-disciplinary teams, including 2D/3D artists, User Experience (UX) designers, and sound experts, to create innovative applications tailored for research, educational, and outreach purposes.

### **Key Projects:**

**Nuclear Engineering Lab Simulator**

Aug 2021 – May 2024

- Developed a high-fidelity, nuclear reactor simulator in **Unity** with two deployments for windows and web applications, designed for operator training and research analysis
- Applied real-time game development techniques and Integrated **MATLAB** for complex calculations, such as point kinetics algorithms to achieve interactive simulation and accurate reactor behavior modeling.
- Collaborated with nuclear engineering researchers and presented the project at **NESTet** and **ANS CONTE** conferences, supporting adoption of the simulation in academic and professional training context.

**Shanghai Media Group: Broadcast Design Intern**

June 2019 – July 2019

- Practiced and participated in the post-production of TV programs using visual effect compositing skills with **Adobe After Effects**.
- Worked with a professional team to design and produce TV openers for local new programs.

## PUBLICATIONS

- McGraw, T., Zhou, X. (2025). *Real-time voxelized mesh fracture with Gram-Schmidt constraints*. *Computers and Graphics*, Elsevier. <https://doi.org/10.1016/j.cag.2025.104382>

Full portfolio at <https://joycethecreator.github.io/>

## SELECTED TECHNICAL PROJECTS

---

### Interactive XPBD Simulation in Compute Shaders (Master's Thesis)

Aug 2023 – May 2024

- Developed a **GPU-accelerated** Extended Position-Based Dynamics (XPBD) framework leveraging voxelization and compute shaders to simulate deformable soft bodies in real time, achieving higher performance and stiffness than traditional tetrahedral approaches.
- Proposed LoD-aware voxel constraint generation and **partitioning** techniques that improved simulation fidelity and efficiency; demonstrated automatic **long-range constraint** synthesis enabling stable self-supporting complex models.

### Ruled Surface Designed

Jan 2023 – May 2023

- Built an Interactive **OpenGL** geometry tool allowing users to sketch 2D points and generate ruled-surface triangle meshes with adjustable subdivision resolution
- Implemented real-time mesh generation, VAO/VBO rendering, and trackball camera controls for interactive 3D preview. Designed a triangle-based export pipeline to generate .OBJ files suitable for 3D printing.

### Fluid Simulation with Smoothed Particle Hydrodynamics (SPH)

Jan 2023 – May 2023

- Implemented a **particle-based fluid simulator** using Smoothed Particle Hydrodynamics (SPH), modeling incompressible fluid behavior through density estimation, pressure forces, viscosity forces, and external forces within a Lagrangian simulation framework.
- Designed and implemented the full simulation pipeline, including **kernel-based neighborhood queries**, pressure computation, time integration, and **real-time collision handling** against static boundaries, producing stable and visually convincing fluid motion.
- Built an interactive system with **tunable physical parameters** (rest density, stiffness, viscosity, smoothing radius, time step) to explore stability–performance tradeoffs and demonstrate real-time fluid behavior through a live visual demo.

## SELECTED CREACITVE & PRODUCTION PROJECTS

---

### Short Film Project: Producer, Editor, Camera Operator

- Contributed across the full filmmaking pipeline as producer, camera operator, and editor, supporting on-set production and post-production delivery.
- Shot and edited key scenes with disciplined control of framing, continuity, pacing, and narrative flow, ensuring visual consistency across the film.
- Executed post-production including editing, color grading, and audio cleanup/mixing using **Adobe Premiere Pro** and **Davinci Resolve**.

### 48 Hours Film Production

- Created and delivered a complete narrative short film independently within a 48-hour production window, emulating the style and pacing of a selected French film.
- Lead all aspects of production, including writing, directing, cinematography, performance, and editing, under strict time constraints.
- Edited and finished the film using **Adobe Premiere Pro** with basic visual effects and compositing in **Adobe After Effects**.