**SHIRLEY XU**

Software Developer

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## EXPERIENCE

### GoInvo — Software Developer & Designer

*Waltham, MA | Sept 2023 – Present*

- Architected and built a production website using Next.js 16, React Server Components, Sanity CMS (9 document types, 8 custom portable text blocks), and Framer Motion page transitions.
- Built a programmatic video generation platform (Remotion 4, React, TypeScript) with dual local/cloud rendering: AWS Lambda orchestration, S3 output, SSE progress streaming, IAM policy management, and Stripe-integrated billing. Reduced per-video production from a full day to minutes; SHA256-based scene caching cut incremental edits by 80%+.
- Delivered two interactive web applications for a federal healthcare agency (NDA): persona-driven conversational UI with audio narration and a systems-level interactive visualization.
- Co-led qualitative research across 3 interview rounds with 79 participants, synthesizing 1,177 data points into 24 barrier themes for mental health care access.

### Tomeato Studios — Game Developer

*Keene, NH | Mar 2022 – Sept 2023*

- Built high-performance Godot 4.1 GDExtensions in C++: compute shaders, octree spatial indexing, GPU instancing, and a custom Entity-Component System supporting 100K+ concurrent entities.
- Implemented 12+ interconnected gameplay systems (energy networks, fluid dynamics, train logistics, formation AI with flocking, crafting, skill trees) running simultaneously on the ECS.

### Lunatic LLC — Game Developer

*Remote | Jun 2020 – Jan 2022*

- Built a procedural room generation system, a wall-running physics system, and custom UI shaders for a game project on a small independent team.

### Dell EMC — Escalation Engineer (Intern)

*Hopkinton, MA | May 2019 – Aug 2019*

- Automated triage of thousands of storage array outputs with Perl scripts (NGTRiiAGE); supported RAID-based storage pools and diagnostics via Linux CLI.

**SELECTED PROJECTS**

**Project FELINES — Iron and Ferroptosis in Neurodegeneration**

- Built a full-stack research platform (Next.js, TypeScript, Tailwind, Recharts, Framer Motion) investigating iron-driven neurodegeneration across 6 diseases. Features include a 300+ drug trial browser with outcome encoding and inline citations, a 217-gene GWAS risk mapper, a 3-state ODE iron clearance simulator (RK4 solver, APOE4 calibration, 7 disease extensions), and scroll-driven SVG walkthroughs of ferroptosis defense pathways.
- Engineered a zero-re-render scroll choreography system using MotionValue-based transforms, portal tooltips for z-stacking, a modular citation engine with text-fragment linking, and accessible sticky-stage animations with prefers-reduced-motion support.

**CANIS (Causal Analysis Network for Interactive Systems) — Rust/WASM Graph Engine**

- Built a Rust/WASM graph engine (331KB) with petgraph, running 6 algorithm categories (centrality, path analysis, cycle detection, community detection, robustness, layout) in a Web Worker with zero main-thread blocking.
- Designed the Systems Biology Stock-Flow (SBSF) framework: 17 relation types, 7 causal confidence levels, and quantitative annotations (kinetic parameters, effect sizes) in a typed graph.

**Glacias — WebGL2 Real-Time Glass Distortion Engine**

- Built a standalone WebGL2 engine using GLSL fragment shaders with SDF-based refraction, chromatic aberration, and Felzenszwalb-Huttenlocher distance transform for arbitrary SVG-to-SDF conversion. Zero dependencies.

**SKILLS**

**Languages:** Python, JavaScript/TypeScript, Rust, C++, Java, Perl, GLSL, SQL, GDScript

**Frameworks & Tools:** Next.js, React 18, Node.js, Android, Tailwind CSS, Framer Motion, Remotion, Godot 4, WebAssembly, WebGL2, D3.js, Storybook, Vite, WordPress

**Infrastructure:** Git, Linux, Docker, AWS, Arduino, Sanity CMS, CI/CD

**Domain:** Healthcare/medical UX, accessibility (508 compliance), systems biology, bioinformatics, data visualization, Agile/Scrum

**EDUCATION**

**Brandeis University** — MS, Bioinformatics

**University of Massachusetts** — BS, Computer Science; Minor: Linguistics