

Yuankun Huang

Senior Software Engineer — Real-Time Game Systems

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Client & systems engineer with **5+ years** shipping and operating a live-service title from **prototype to global launch** (10M+ downloads). I build the parts of games where timing, determinism, and memory budgets are non-negotiable — and I prove it with **CI-enforced engineering contracts**, not claims.

CORE SKILLS

Languages	C++20, C# (expert), Python
Engines & Runtime Systems	Unity (production, shipped), Unreal Engine 5, SFML, miniaudio Deterministic record/replay, audio-clock timing pipelines, gameplay systems (networking, UI, multiplayer state sync), protobuf, hot-update (ILRuntime)
Build & Quality Performance	CMake, vcpkg, doctest, GitHub Actions CI, headless test gates, custom allocation guards Zero-allocation hot paths, object pooling, Unity Profiler / Frame Debugger, low-end device optimization
Certification	Unity Certified Expert: Programmer

SELECTED PROJECTS

Rhythm Fruit Shop — Native C++ Game Core [GitHub] *C++20 / SFML / miniaudio / CMake / CI*

- Built a real-time rhythm core where song time derives from the **audio backend's PCM cursor** through an **EMA-smoothed clock** (not frame deltas); input events carry host-monotonic timestamps reverse-mapped to song time for judgment-grade accuracy.
- Implemented **deterministic record & replay** on a headless session core; a perfect-run invariant test validates a flawless synthetic playthrough against an **independent Q16 fixed-point scoring oracle**.
- Enforced a **zero-allocation gameplay hot path** via a custom operator `new` AllocationGuard and provable layering via **CMake dependency guards** — all gated as **required headless CI checks** (no window, no audio device).

Synapse — Cross-Language Distributed Simulation [GitHub] *.NET 8 / Python / Unity*

- Streamed **2,000+ Python-driven agents** into a Unity client at stable **60 FPS**, using lock-free concurrency, pooling, and state conflation to hold per-update managed allocations near **1.4 KB**.

Kodama — Server-Authoritative Multi-Agent Simulation [GitHub] *.NET 8 / Unity*

- Built a distributed real-time simulation sustaining **10K agents** with sub-millisecond server ticks: struct-oriented ECS, spatial partitioning, zero-GC hot path, and a dumb-client renderer using GPU instancing.

PROFESSIONAL EXPERIENCE

Senior Unity Developer May 2025 – Present

IGG Canada — Live Service & New-Title Client Development Vancouver, BC

- Rejoined on **Mythic Heroes** maintenance: legacy defects, obscure production crashes, Unity/SDK upgrade compatibility, and weekly build validation for a mature live-service codebase.
- Moved onto a new unannounced strategy title, building client-side frameworks for live events and lightweight in-game minigames, with configs designers can edit for consistent content iteration.

Career Break: Bereavement & Family Care Sep 2024 – May 2025

Lead Software Engineer (Contract, Hybrid) Jan 2024 – Jan 2025

The HIVE, UBC Faculty of Medicine — Gamified Rehabilitation Platform Vancouver, BC

- Sole engineer for **TrAIT**, a clinically validated Unity rehabilitation system (Leap Motion hand-tracking) with adaptive difficulty (Challenge Point Framework) — owned all engineering, requirements through deployment.
- System achieved **1,000 movements/session** vs. 32 in traditional therapy, supporting published results showing **~13% functional improvement**.

Unity Developer Sep 2020 – Sep 2024

IGG Canada — Mythic Heroes (10M+ downloads) Vancouver, BC

- Core client engineer from early development to **global launch**; implemented client-side networking and multiplayer state synchronization (**Google Protobuf**) for live features including Guilds and Chat.
- Built **GameDataConfig**, a .NET CLI tool decoupling data validation from the Unity Editor — later used as the reference design for the project's production config-table tooling.
- Co-developed a UI framework shared across **500+ screens** (navigation, screen flow) and shipped monthly content through the project's **ILRuntime** hot-update pipeline.
- Profiling-driven optimization for low-end devices (Unity Profiler, Frame Debugger; AssetBundle-based asset restructuring) — part of a team push that cut load times **~30%**, build size **~20%**, and held stable **60 FPS** on mid-range Android for launch.

EDUCATION

M.S. Computer Science (Computing Systems), Georgia Institute of Technology (OMSCS, part-time online) Starting Fall 2026

Master of Digital Media, Centre for Digital Media, Vancouver 2021

B.Eng. Telecommunication Engineering, BUPT / Queen Mary University of London 2019