

Callum Jones

Final-year Computer Science Student

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calwjones.com | [LinkedIn](#) | [GitHub](#)

Final-year Computer Science student who builds parsers, engines, and protocols from scratch rather than wiring libraries together. Recent work: a deployed real-time film-matching web app ([matchsticked.com](#)); a from-scratch C++17 game engine with visual editor (dissertation); and a portfolio with custom WebGL ([calwjones.com](#)).

Education

University of the West of England | BSc Computer Science

Expected July 2026 • On track for First-class

Technical Skills

Languages: Python, TypeScript, JavaScript, C++, C, SQL, HTML, CSS · *Familiar:* Zig, Java

Tools: Git, Docker, Node.js, PostgreSQL, SQLite, CMake, Next.js, Express, Socket.IO, Prisma

Concepts: Engine design, real-time systems, cellular automata, expression parsing, REST APIs, database design

Projects

Matchsticked | Real-time group film-matching web app

[Live](#) · [GitHub](#)

- Shipped a deployed multi-user film picker built on Next.js, Express, and Socket.IO; two phones swipe through TMDb in a shared session and surface a match the moment both vote yes.
- Built a server-authoritative session protocol: clients re-sync from server state on reconnect rather than replaying queued events.
- Hardened auth with enumeration-safe registration, timing-safe login, CSP headers, and rate limiting on sensitive routes.
- Wrote a Letterboxd watch-history scraper with cookie-aware sessions, ScrapingAnt/ScraperAPI proxy fallback, and confidence-thresholded fuzzy TMDb matching.
- *Stack:* TypeScript, Next.js, Node.js, Express, Socket.IO, Prisma, PostgreSQL (12 models, 18 migrations), Docker

2D Game Engine + Visual Editor | Final-year Dissertation

[GitHub](#)

- Built a C++17 platformer engine, ImGui level editor, and standalone runtime as three separate CMake targets with strictly downward dependencies; engine library compiles and links without ImGui.
- Embedded a live SFML render-target inside ImGui as a draw-image with an invisible input button on top, transforming mouse coordinates back through pan/zoom into world space for click-to-select, drag, and multi-select.
- Fixed-timestep physics at 60 Hz with AABB min-penetration-axis resolution, scaled from pairwise checks to a 128×128 px uniform spatial grid; holds 60 Hz at 300+ entities.
- Editor supports prefabs, command-pattern undo/redo with batched compounds, and JSON round-trip via subclass-owned serialisation. Verified by 12 Catch2 test files alongside a 24-test manual plan.
- *Stack:* C++17, SFML, Dear ImGui, RapidJSON, Catch2, CMake (cross-platform macOS/Windows)

Tetris with Sand Physics | Browser game with custom physics mode

[GitHub](#)

- Custom sand mode where locked pieces dissolve into individual coloured grains via momentum-based cellular automata; lines clear when a colour bridges left-to-right, detected by 8-connected BFS flood-fill.
- Held 60 fps under heavy grain load using typed-array grid storage, precomputed trig lookup tables, and timestamp hoisting. Express + SQLite leaderboard with score sanitisation, rate limiting, and per-mode separation.
- *Stack:* JavaScript (ES6 modules, no build step), HTML5 Canvas, Node.js, Express, better-sqlite3

Scientific Calculator | Desktop app with hand-built expression parser

[GitHub](#)

- Implemented a Shunting-yard parser and RPN evaluator with operator precedence, variable storage, and unary/binary minus disambiguation; no language interpreter is run against user input. MVC architecture across model/view/controller. *Stack:* Python, Tkinter (standard library only)

Experience

Customer Service Assistant | BetterFood, Bristol

Apr 2024 – Present

- Provided customer service in a fast-paced retail environment, operating tills and coordinating with colleagues on stock management.

Kitchen Porter | The Beehive, Bristol

Sep 2023 – Jan 2024

- Maintained operational efficiency and hygiene standards during high-pressure service periods.

Bartender | Wrottesley Arms, Wolverhampton

Jul 2023 – Sep 2023

- Served customers and coordinated with staff in a busy pub environment.