Janitha Prebhaswara Illankoon

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Profile

Final-year Computer Science undergraduate and prolific solo builder focused on systems-level engineering and provable correctness. I design and ship cross-platform software from first principles, from raw-socket servers and physics integrators to native Android automation engines and multi-agent AI pipelines, driven by a deep interest in formal verification: software that is provably right, not merely tested.

Education

BSc in Computer Science, Major in Software Engineering — Expected June 2027

Edith Cowan University (ECU), Sri Lanka · Final Year

Selected Coursework: Data Structures & Algorithms (CSP2348) · Object-Oriented Programming with C++ (CSP2104)

Cambridge International AS & A Levels — Cambridge

Computer Science · Pure Mathematics · Physics

Technical Skills

Languages	C/C++17, Java, Kotlin, Python, TypeScript, SQL (learning Rust, Haskell, OCaml)
Systems	Win32 API (ctypes), Winsock2, sockets/HTTP from scratch, Tauri/Rust, Docker, Linux/WSL
Android	Jetpack Compose, Material 3, NotificationListener, RemoteInput, Foreground Services
Web	React 19, Vite, PWA, IndexedDB/Dexie, Radix UI, Chart.js, Chrome MV3
AI / ML	Ollama, ChromaDB, MCP, multi-agent orchestration, Hugging Face
Formal Methods	Coq, Lean 4, Agda, Z3 (self-study)

Selected Projects

Enclave: Local-First Finance & Life Planner — Flagship · 2026 · Solo

Architected a privacy-first, offline-first personal-management platform from a single React 19 codebase, cross-compiled to Windows (Tauri 2 / Rust), Android (Capacitor), and web/PWA, backed by a relational SQLite layer with a transparent JSON fallback and AES-GCM encrypted peer-to-peer LAN sync. Designed an adaptive scheduling engine that re-solves the daily timeline under fixed-commitment constraints.

React 19 · Tauri 2 (Rust) · Capacitor 8 · SQLite

GhostProtocol: Android Automation Engine — 2025–26 · Solo

Built a foreground-resident automation engine that intercepts notifications via `NotificationListenerService` and injects context-aware replies through the hidden `RemoteInput` action, modeling per-sender behavior as a finite-state machine with rate-limiting, cooldowns, and duplicate-echo suppression. Hardened against process death across Android API levels O–Tiramisu.

Java · NotificationListenerService · FSM · ContactsContract

HabitTracker: Gamified RPG + From-Scratch C++ Server — 2025–26 · Solo

Engineered a custom HTTP/REST server from raw Winsock2 sockets in C++17 with no web framework, owning the full request lifecycle from socket accept through header parsing to JSON serialization. Backed a gamified productivity client with atomic server-client state synchronization.

C++17 · Winsock2 · nlohmann/json · Vanilla JS · Chart.js

Principia-Lite: Deterministic 2D Physics Engine — 2025–26 · Solo · MIT

Implemented a deterministic, zero-dependency 2D physics engine in C++17 from first principles: semi-implicit Euler integration for energy stability, AABB broadphase collision detection, and fixed-timestep stepping for frame-rate-independent, reproducible simulation.

C++17 · Numerical methods

AI Critic Pipelines: Multi-Agent Critique — 2025–26 · Solo

Designed a multi-agent LLM critique system chaining four specialized personas (structure → technical → reasoning → synthesis) with prior-aware structured prompting, emitting structured JSON and HTML reports. Built parallel local (Ollama) and frontier-cloud variants to weigh cost and latency tradeoffs.

Python · Ollama · Multi-agent orchestration

Research Interests

Formal verification and proof assistants (Coq, Lean 4, Agda, Z3) · type theory and provably-correct software · high-performance systems and computational mechanics; ongoing self-study grounded in SICP and category theory. Full case studies and source at janithaillankoon.dev.