

Simon Vutov

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SKILLS

Systems: C, C++, Rust, Python, Linux/Unix, Git, Docker, GDB, Valgrind, CMake, Make, CI/CD
Embedded & Reliability: firmware, ARM cross-compilation, binary protocols, serialization, real-time systems, unit testing
Backend & Data: TypeScript, React, FastAPI, PostgreSQL, SQL, REST APIs, Prometheus, Grafana, performance testing
Simulation & Numerical: Unity/C#, physics simulation, numerical methods, linear algebra, PyTorch, CUDA

EXPERIENCE

Software Engineer Intern May 2026 – Present
Deephaven Remote
– Shipped TypeScript/React features for Deephaven Iris and web-client, including query-server dashboard badges, dashboard tab tooltips, advanced filter dialogs, and production UX fixes.
– Built UI algorithms and components for real-time tables with up to 10^{15} cells, supporting Fortune 500 users processing live data.
– Parallelized Deephaven plugin end-to-end tests by browser, reducing runtime by over 70%.
– Added programmatic table sort support across Python API serialization, frontend hydration, and test fixtures.

Firmware Developer Apr 2026 – Present
UW Orbital Waterloo, ON
– Built cross-repository binary log compression for satellite firmware and ground-station tooling, reducing representative logs from 271 to 69 bytes while preserving exact text decoding.
– Implemented host-testable C logging codec with generated file-ID tables, runtime-selectable binary output, and ARM cross-compile verification for flight firmware.
– Mirrored the wire format in Python ground-station utilities with stream resynchronization, text-to-binary round trips, CLI decoding, and 23 pytest cases.
– Optimized firmware alarm queue dequeue from $O(n)$ shifting to $O(1)$ pop by changing queue ordering and updating earliest-alarm RTC checks.

Software Engineer Intern Sept 2025 – Dec 2025
BitGo Palo Alto, CA
– Shipped security-critical intent verification preventing blind signing in Wallet Platform TSS transaction flows.
– Built Prometheus metrics and Grafana dashboards for verification failures, improving visibility into production security safeguards.
– Implemented feature-flagged rollout and reusable transaction parsing for staged deployment across blockchain protocols.
– Improved platform reliability by debugging 5xx errors and transaction validation failures in backend services.

Software Engineer Intern Jan 2025 – Apr 2025
GenerativeModels.AI Toronto, ON
– Built full-stack React/Next.js and FastAPI product with custom editor, GPT co-writing, semantic search, and AI generation.
– Implemented FAISS-backed semantic search over 70k documents with sub-800ms responses.
– Automated Docker-based Airflow ingestion for 900k Amazon product listings.

PROJECTS

Rust Notes Web App | Rust, HTTP, Auth, REST API, Persistence Dec 2025
– Built Rust HTTP server with authenticated notes REST API supporting CRUD, pinning, tagging, ordering, and timestamped change history.
– Implemented bcrypt password hashing, expiring Bearer tokens, and JSON persistence with auditability.

Invariant – C++ Linear Algebra Library | C++17, CMake, Numerical Methods 2026
– Developed header-only C++17 template library for matrix/vector operations, polynomial interpolation, linear system solving, and stochastic matrix analysis.
– Implemented Gaussian elimination, Jacobi iteration, Horner evaluation, and unit-tested numerical-method utilities.

SimpleCar2 – Vehicle Physics Simulation | Unity, C#, Physics Simulation Aug 2025
– Engineered vehicle physics with custom suspension, tire traction, torque curves, gear ratios, RPM calculations, and angular acceleration.
– Created technical tutorial with 50k+ views; overall engineering education channel has 200k+ views.

Rocket Landing Automation | Unity, C#, Control Systems Nov 2023
– Built autonomous rocket-landing simulation with thrust vectoring and trajectory-control logic inspired by Falcon 9 recovery.

EDUCATION

University of Waterloo Waterloo, ON
Bachelor of Applied Science in Computer Engineering Expected Apr 2029
– Relevant coursework: Algorithms & Data Structures, Digital Computers, Digital Circuits, Electronic Circuits, Numerical Methods, Discrete Mathematics. Top 10% in ECE 250.