

Mathéo Delbarre

Systems / Compiler / Backend Engineer · Low-level systems engineer
building compilers, runtimes, rendering pipelines, and distributed
backends in C++ / Rust / LLVM.

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FR (native) · EN (professional, TEPI TECH 765)

EDUCATION

EPITECH Nancy — Grande École Program in Computer Science (M.Sc. track) · 3rd year2024 – 2029 · Nancy, FR

Coursework: compilers · operating systems · networking · algorithms · graphics · cybersecurity · functional programming.

EXPERIENCE

AT7 Système — Software Engineering InternAug 2025 – Dec 2025 · Saint-Avold, FR

Modernization & web migration of a proprietary WinDev-based enterprise management platform.

- Architected and shipped a full-stack web platform replacing the legacy WinDev stack — covering project tracking, payroll, intervention management, and operations workflows.
- Engineered React + TailwindCSS front-end against a typed TypeScript API; integrated heterogeneous enterprise databases via ODBC, OLEDB, and HFSQL.
- Hardened public surface with schema validation, input sanitation, and an Nginx reverse-proxy security layer; containerized internal services with Docker for reproducible deploys.
- Implemented GDPR-compliant handling of sensitive enterprise data and contributed to backend interoperability for legacy software modernization.

SELECTED ENGINEERING PROJECTS

druk-lang — LLVM-Backed Programming LanguageC++ · LLVM · IR · JIT/AOT

Engineered a fully compiled programming language with custom front-end, AST, type system, and an LLVM IR generation pipeline supporting both JIT and AOT execution.

- Designed parser, AST, and static type system; emitted optimized LLVM IR feeding both JIT and AOT backends.
- Implemented pattern matching, lambdas, recursion, string interpolation, arrays, and control-flow analysis.

ZamSync — Offline-First Sync Engine

Built a WAL-backed event store (ChaCha20-Poly1305 encryption, CRC32 per record) and Hybrid Logical Clocks for drift tolerance — replicated 5,000 events with zero loss across a simulated 2G link (23 kbps, 600ms latency, mid-transfer TCP cut).

Modular Arcade Platform — Hot-Swappable Rendering PluginsC++ · SDL2 · SFML · NCurses · dlopen

Architected a plugin-oriented arcade runtime with three rendering backends loaded dynamically as shared objects at runtime.

- Engineered runtime polymorphism over dlopen / dlsym / dclose with strict ABI-stable C++ interfaces.

Distributed Team-Communication Backend (Teams-style)Rust · TCP · Event Loop · Custom Protocol

Built a scalable single-threaded server and CLI client over non-blocking TCP, supporting concurrent users, channels, threads, and direct messaging.

CPU Raytracing EngineC++ · Rendering Math · SIMD-friendly

Developed a CPU raytracer rendering configurable 3D scenes with reflection, shading, and physically inspired lighting.

Astrophysics & Ray-Marching Simulation EngineRust · N-Body · SDF Ray Marching

Engineered a dual-mode simulator combining Newtonian N-body gravitation with sphere-traced SDF geometry.

Reproducible Jenkins CI/CD Platform (IaC)Rust · Jenkins · JCasC · Job DSL · Docker

Designed a fully reproducible Jenkins infrastructure provisioned via Configuration-as-Code and Job DSL.

Unix Shell — AST-Based Parser & ExecutorC · Linux · Process Mgmt

Implemented a POSIX-style shell with tokenizer, AST parser, pipe and redirection support, and process orchestration.

TECHNICAL SKILLS	
LANGUAGES	C · C++ · Rust · Python · TypeScript · JavaScript · SQL · Bash
COMPILERS / RUNTIMES	LLVM · JIT/AOT Compilation · AST Parsing · IR Optimization · Runtime Systems · Dynamic Linking (dlopen) · Plugin Architecture
SYSTEMS	Linux Internals · Memory Management · Multithreading · Event-Driven Architecture · TCP/Non-Blocking I/O · Protocol Design · Process Management
PERFORMANCE / GRAPHICS	CPU Raytracing · SDF Ray Marching · N-Body Simulation · Numerical Methods · Performance Optimization · Rendering Pipelines
SECURITY	Binary Exploitation · Heap / Stack Overflows · GOT Overwrites · Reverse Engineering · Web Hardening · GDPR Compliance
INFRA / DEVOPS	Docker · Jenkins (JCasC, Job DSL) · CI/CD Automation · Nginx · PostgreSQL · Git · REST APIs
ML / DATA	TensorFlow · PyTorch · Scikit-learn · Pandas · Computer Vision · Unsupervised Learning
FRONTEND	React · TailwindCSS

COMPETITIVE SECURITY & ACHIEVEMENTS

Binary Exploitation CTF — Top 5 / 90EPITECH

Stack/heap overflows, GOT overwrites, ROP-style chains, reverse engineering, and Linux binary exploitation against custom CTF challenges.

OWASP Juice Shop — Top 7 / 149Inter-campus

Solved 119 web-security challenges spanning XSS, SQLi, broken access control, crypto, and business-logic flaws.