Emilien **Breton**

PROJECTS

Atto-8 Microcomputer

A MINIMALIST 8-BIT MICROCOMPUTER WITH STACK-BASED MICROPROCESSOR *Rust • Assembly*

- Designed ecosystem of hardware and software from logic gates upward, including instruction set architecture, from-scratch assembler and cross-platform emulator, totaling over **15 000 SLOC** and **500 hours** of work.
- Wrote various demos in Assembly running natively on microcomputer — memory monitor • sprite editor • Tetris clone • self-assembling native assembler • postfix notation calculator.
- Built microcomputer in hardware using discrete 74HC-series logic chips on breadboards.

Atto-8 C Compiler

A RUDIMENTARY C99 COMPILER FOR THE ATTO-8 MICROARCHITECTURE *Rust • C • Assembly*

- Building C99 compiler from scratch in Rust targeting Atto-8 Assembly language.
- Developed extensive C standard library, including heap allocator supporting **malloc and free** and string handling functions such as **strlen and memcpy**.
- Hand-wrote printf implementation in Assembly which supports conversion specifiers %d, %u, %x, %c, %s and %p, increasing debugging efficiency and convenience.

DBLess Password Manager

A HASH-BASED, DATABASE-LESS PASSWORD MANAGER *C • Python*

- Devised custom cryptographic procedure based on SHA-256 in Python which deterministically generates passwords on demand without requiring encryption or password storage.
- Reimplemented password generation algorithm in C for use as interactive CLI tool.

Personal Portfolio

A PORTFOLIO FOR SHARING VARIOUS PROJECTS *Markdown • Next.js*

- Designed and implemented appealing UI and optimized UX using Google Search Console resulting in over **15 000 unique visitors** to portfolio website a month.
- Leveraged Cloudflare caching system and optimized site-wide accessibility resulting in Lighthouse score consistently over **95%**.

Legacy Protocol

SUBMISSION FOR DEFI THE CONVENTIONAL 2022 *React • Rust*

- Won **first place** in Finance category of Canada's largest DeFi hackathon along with **2500$ prize** as part of 3-member team.
- Engineered MVP smart contract backend and API from scratch in Rust with no prior experience in Web3, all within limited **36-hour timeframe**.
- Worked in collaboration with Terraform Labs post-hackathon to officialize our protocol and secure additional funding prior to Terra Luna collapse.

VOLUNTEERING

Hack the Hill Hackathon

DEVELOPMENT MANAGER — DEVELOPMENT TEAM *Ottawa | November 2022 — Present*

- Leading development of open-source participant tracker built with Next.js and Prisma, used by over **1000 hackers** and **50 organizers** throughout hackathon.
- Built and maintained internal sporsorship payment portal powered by Stripe and React.js in collaboration with infrastructure and sponsorship teams, enabling processing of over **20 000$**.

uOttawa Computer Science Club

CLUB EXECUTIVE *University of Ottawa | June 2022 — Present*

- Building community of **over 1000** computer science students at the University of Ottawa.
- Collaborated with both other executives to brainstorm, organize and schedule a dozen events by designing marketing material using Figma and organizing workshops for over **100 students**.

EXPERIENCE

Zeptile Software

SOFTWARE ENGINEER — WEB3 *Remote from Ottawa | October 2022 — Present*

- Implemented various smart contracts in Solidity as per specification and ensured **100% test coverage** through Chai and Hardhat.

SKILLS

Languages

Rust • C • Python • JavaScript

Development Tools

NixOS • Neovim • Fish Shell • Git

Other Technologies

React • Node.js • HTML • CSS • JSON • YAML • Markdown • LaTeX • Lua • x86 Assembly • C++ • Bash • GDB • Linux • Arduino • VS Code • Figma • Notion • Docker • Cloudflare • GitHub

Spoken Languages

- French *Native*
- English *Native*
- Spanish *Intermediate*
- Russian *Elementary*

Other Interests

Electronics • Robotics • 3D Printing • Drone Building • Mathematics • Finance and Investing • Productivity • Music

CONTACT

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