Mathieu Dutour Sikirić

Summary: Senior systems and blockchain engineer (15+ years) specializing in Rust, `C++` and high-performance distributed systems. Strong background in compiler technology, blockchain protocol design (L1 and L2), EVM/WASM runtimes, cryptography, and high-frequency trading infrastructure. Published author (4 books, 115 papers) with extensive experience in scientific computing and algorithms.

Key Skills

Artificial Intelligence: MCP (using and writing); Orchestration (Openclaw); local models.

Programming Languages: Rust (5 years); C, C++ (20+ years, modern C++11/14/17); NodeJS/Javascript (2 years); Python (10 years); OCaml (1 year); Fortran 90 (15 years); Solidity (3 years); Java (2 months); GAP (20 years); Perl (10 years); Matlab (10 years); Haskell.

Systems & Parallelism: Distributed systems, low-latency/high-throughput optimization; MPI; OpenMP; actor-based systems; lock-free data structures; POSIX/C++11 threads; Qt threads.

Blockchain & Cryptography: Blockchain protocols (consensus, scalability); EVM and REVM; Solidity smart contracts; sidechains and L2 (rollup-like systems); elliptic curve cryptography, ECDSA, RSA, symmetric crypto, hash functions, zero-knowledge proofs, multi-signature schemes.

Compilers & Optimization: Compiler design (lexer/parser, AST, SSA/ANF IRs, compiler passes); LLVM toolchain; Python-to-native compilation for numerical workloads; algorithmic optimization for financial and scientific computing.

Mathematics & Scientific Computing: Linear, integer and semidefinite programming; SAT/SMT; computational geometry and polyhedral computations; numerical methods for PDEs and wave modelling.

Tools & Workflow: Git (GitHub, GitLab, PR-based workflow); Docker; Linux/Unix, macOS, Windows; unit testing, CI, performance profiling (gdb, valgrind, sanitizers, profile guided optimization).

Work Experience

Remote Senior Software Engineer *linera.io* Sep 2022 – Present
Rust, Solidity

- Core contributor with 510+ merged PRs to the Linera L1 protocol.
- Implementation of storage on Linera by building database agnostic interfaces.
- Improvement to the protocol of Linera.
- Implementation of a decentralized exchange on the linera blockchain.
- Ethereum interoperability, addition of EVM support in Linera.
- Worked on prediction market contract code and the front-end.

Remote Senior Software Engineer *Arrow Markets* Apr 2022 – Aug 2022
Python

- Developed faster numerical algorithms for financial mathematics computations in options markets.
- Implemented calibration and fitting algorithms for option volatility parametrization.

Remote Senior Software Engineer *Simplectica* Mar 2021 – Nov 2021
C++, OCaml, Python

- Developed a high-performance trading system for the Nasdaq and CBOE.
- Did general multiprocessing architecture (between tactics, strategies and book builder)
- Did the simulator of the matching engine of Nasdaq.

Remote Senior Software Engineer *Bodo.ai* Oct 2019 – Sep 2020
C++, SQL, Python

- Co-developed a Python compiler targeting Pandas for extremely high-performance within the Python ecosystem.
- Implemented `C++` backends and `MPI`-based parallelization for large-scale data workloads.
- Added new language features and optimizations to the compiler.

Remote Senior Software Engineer *Alacris* Dec 2018 – Sep 2019
Haskell, OCaml, Solidity, Rust, JavaScript, Docker

- Developed a layer 2 sidechain for Ethereum. User security guaranteed by the smart contract on the Ethereum blockchain.
- Participated in a DSL compiler that allowed to check at compile time the absence of bugs in smart contracts.

Remote Developer *Second Bridge* Jun 2016 – Oct 2017
C++, Perl, Python, Java, Qt

- Developed algorithms for ranging in a system of interconnected cards and position determination.
- Designed network protocols and multithreaded architecture for card-to-card communication.

Scientific Researcher *Rudjer Bošković Institute* Jan 2006 – Nov 2018
Fortran, C++, Matlab, Python

- Published 4 books and over 110 research papers; completed around 200 peer reviews.
- Supervised and advised 2 graduate students.
- Implemented an operational ocean wave model for the Croatian Meteorological Agency.
- Developed numerical software for data analysis and large-scale scientific simulations.

Education

- Ph.D. thesis at Université Paris 11 Orsay, France
- Masters student in École Normale Supérieure, France
- Undergraduate student in École Normale Supérieure, France (25th on 500+ candidates)
- Professor Agrégé in Mathematics (32th on 2138 candidates)
- Languages: French (Native), English (Excellent), Croatian (Good)

Selected public projects

1. **Linera-protocol**: (Rust) L1 blockchain protocol for fast, scalable payments with microchains. Senior developer and core contributor affecting protocol, runtime, storage and EVM integration.
2. **Polyhedral**: (C++) Library for polyhedral computations (lattices, polytopes, groups, quadratic forms). Primary developer of 170K LOC; used for record-breaking computations in computational geometry.
3. **Ocean Works**: (C++) Software for plotting, interpolation and oceanographic computations. Sole author and maintainer.
4. **WaveWatch**: (Fortran) Third-generation ocean surface wave forecast system. Implemented key features such as geographical partitioning and implicit evolution schemes.

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