

Informatics student focused on quantitative finance, market data, research engineering, and reproducible analytical systems.

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## Research profile

I am a Czech informatics student building toward quantitative finance through research, software, financial models, market data, and stronger mathematical foundations. My publication standard is deliberately narrow: every public project should state the problem, exact role, data provenance, method, result, validation, limitations, and reproducibility boundary.

**Research interests:** volatility and liquidation dynamics; portfolio survival; financial econometrics; market-data quality; research infrastructure; reproducibility; privacy-preserving systems.

## Education

### Czech University of Life Sciences Prague

Current

#### Bachelor's studies in Informatics · Faculty of Economics and Management

Selected foundation: programming, algorithms, computer architecture, mathematics, mathematical logic and graph theory, object modeling, information systems, and related quantitative coursework.

### University of Wisconsin-Madison

Academic year 2025-2026

#### Exchange studies

Coursework included Financial Management, Advanced Corporate Finance, Financial Statement Analysis, Principles of Macroeconomics, Introduction to Finance, Engineering Economy, Intermediate Microeconomic Theory, industrial engineering, and computer science.

### Secondary Technical School of Electrical Engineering, Frantisek Krizik

Completed

#### Information Technology

Technical secondary education in information technology and electrical-engineering context.

## Selected public technical work

### Volatility Cascade Engine

March 2026 · reproduced 29 July 2026

#### Implemented research prototype · author · Python · synthetic data

A deterministic simulation of leverage, margin pressure, forced liquidation, and endogenous price impact across overlapping synthetic portfolios.

- Defined six synthetic fund balance sheets, five synthetic assets, overlapping exposure templates, margin thresholds, liquidation fractions, market depth, and exponential price impact.
- Ran a deterministic 15-scenario shock sweep from 2% to 30%; published the full table, model specification, accessible figures, checksum, unit tests for core invariants, and limitations.
- Explicit boundary: not empirical calibration, crash prediction, broker-margin replication, production risk management, or investment advice.

**Work in progress · collaborative public repository · Rust · arkworks**

The repository builds Poseidon-based commitments, a Merkle tree and root, and membership proofs over field elements, while keeping the threshold comparison native.

- Public history attributes the initial core implementation to a collaborator; my documented commits updated the README and modules for Poseidon, Merkle proof, and Merkle tree logic.
- Added an explicit warning that the included Poseidon parameters are manual demonstration values and should not be used as production cryptographic parameters.
- Documented limits: no zero-knowledge circuit for the threshold, placeholder parameters, no byte/range encoding, and experimental status.

## Technical notes

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### How to read a stylized cascade model without overclaiming

Technical note · 29 July 2026

Mechanism-first interpretation of cascade simulations, separating observations generated by the code from empirical, predictive, or causal claims the model does not support.

### Where the Merkle/Poseidon prototype stops

Technical note · 29 July 2026

Boundary audit covering membership proofs, the native threshold check, placeholder Poseidon parameters, input encoding, authorship, tests, and requirements for stronger claims.

## Technical capabilities

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### Programming and data

Python, Rust, pandas, NumPy, Matplotlib, NetworkX, Git/GitHub, APIs, automation, deterministic testing, and static-site delivery.

### Quantitative and financial

Financial modeling, market and options data workflows, scenario analysis, liquidity and margin concepts, validation design, data provenance, and research communication.

### Research engineering

Deterministic runs, versioning, data provenance, explicit assumptions, reproducibility bundles, claims registers, public/private data boundaries, accessible charts and technical reports.

### Languages

Czech: native. English: advanced professional and academic proficiency. German: elementary and in development.

## Current priorities

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- Complete the bachelor's degree and strengthen mathematics, probability, statistics, and econometrics.
- Produce reproducible quantitative studies with point-in-time data, realistic costs, chronological validation, and honest falsification attempts.
- Contribute to demanding quantitative, data, financial-engineering, or research-software environments.

**Public boundary:** This is a personal academic and technical record. It does not imply an operating investment firm, fund, regulated advisory activity, production-grade system, or ownership of confidential institutional research.

Updated 29 July 2026. HTML source of truth: [davidanderle.com/cv/](https://davidanderle.com/cv/)