Denys Shkola

Software Engineer at Erste Digital · MSc Mathematics student, University of Vienna

Applied AI and quantitative development · full-time from autumn 2027 · authorized to work in Austria, open to EU relocation

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EXPERIENCE AND LEADERSHIP

Erste Digital (Erste Group) — **Vienna, Austria**

Software Engineer · case study: alphashk.github.io/work/erste-ai-modernization — *Sep 2024 – Present*

- Lead an internal AI accelerator team and built an AI modernization pipeline for legacy Natural/Adabas mainframe code: call-chain mapping → source ingestion → AI analysis and as-is documentation → generated Java/OSB connectors → review-ready PRs.
- Delivered **5 complete use cases and 10+ connectors**; typical use-case cycle time fell by **over 80%**, from more than three monthly release cycles to under one work week and a single release ($n = 5$).
- Orchestrate Copilot CLI, Bash, a deterministic code transpiler, MCP, agents and reusable skills in CI/CD, with quality gates from static analysis, generated tests, code-vs-documentation checks and mandatory human review.
- Maintain customer-data services, the OSB–Natural integration layer and data-delivery endpoints; introduced Kafka lifecycle events (mainframe to Kafka) for traceability and monitoring; own production incidents in a regulated banking environment.

Intern, Mainframe (Natural) Developer: Natural/Adabas customer-database logic and analysis tooling — *Feb 2024 – Aug 2024*

Earlier: Java/Selenium UI test automation at DHL IT Services, Prague (Jun 2022) · iOS prototype in Swift for RegMik, Chernihiv.

WUTIS, Algorithmic Trading division (Vienna student investment society) — **Vienna, Austria**

Fellow Analyst → Senior Associate, Workshop Leader and Recruiter · alphashk.github.io/work/wutis — *Oct 2024 – Summer 2026*

- Led a 3-person CRNN volatility-forecasting team (summer 2025) and a 5-person quantum-ML portfolio team (winter 2025/26); ran coding workshops (Mar 2025 and Mar 2026) and applicant coffee chats; authored the summer-2026 fellowship assignment.

SELECTED PROJECTS

Private multi-exchange crypto market-data platform · co-developer, two-person side project — *Feb 2026 – Sep 2026*

- Production market-data and signal platform, privately owned, with order books from 31 venues: Rust collectors → NATS → Go gateway and market engine → ClickHouse, PostgreSQL, Redis; Node control plane; React/TypeScript UI.
- Implemented 19 of its 33 Rust exchange integrations and the shared normalization framework (about 130 PRs, 101 merged); per-market order-book sequencing removed phantom liquidity walls; live-verified delta continuity (2,634 Bybit deltas, zero gaps).
- The platform measured about 5,000 normalized events/s in production and about 500k WebSocket messages and an HTTP p99 of about 61 ms with zero errors in a one-minute, 25-client load test (measured by the co-developer, Jul 2026).

Pulse: crypto-perpetuals research stack and working paper · solo · alphashk.github.io/work/pulse — *Jul 2026 – present*

- Rust WebSocket ingest (Bybit, Binance) → Redis Streams → Python → Parquet, running 24/7 on a Raspberry Pi 5 under systemd, with a strategy console, a daily Telegram digest and paper execution.
- Counted **1,871 strategy trials** and deflated every result for that count (walk-forward and purged CPCV, HAC t-statistics, deflated Sharpe ratio, PBO, placebo controls); new tests pre-registered in a hash-chained ledger from 12 Oct 2026.
- Surviving book: **Sharpe 3.45** on the 2026 holdout (backtest, after costs), then downgraded by my own adversarial review.

Prediction-market contract matching and arbitrage · solo · alphashk.github.io/work/prediction-markets — *2026*

- LLM matching of equivalent contracts across about 255k Kalshi and Polymarket markets (hybrid retrieval with reciprocal-rank fusion, recall-first LLM triage, strict verification under spend caps), feeding fee-aware two-leg arbitrage detection. Research only.

More: local AI agents on a Raspberry Pi 5 (n8n with Ollama, Qdrant and SearXNG; Aug 2026) · IMC Prosperity 4 (Apr 2026, team entry, reached Phase 2): fair-value models and quoting logic; round-1 test-run PnL up about 2.6× over 8 versions · order-book spoofing-pattern detector (Jun 2026) · public repos (MIT): math-notes-agent-skills, ects-ledger, twisty-lab, puppet-cube-solver.

EDUCATION

University of Vienna — **Vienna, Austria**

MSc Mathematics; research direction: martingale optimal transport and model calibration — *Mar 2026 – expected autumn 2027*

- Summer 2026 research project with Prof. Julio Backhoff-Veraguas: implemented the Bass local-volatility model on SPX options (github.com/AlphaShk/bass-lv-calibration). Grade 1 in the MSc-level proseminars Mathematical Finance (Continuous Time), Advanced Probability Theory and Advanced Numerical Analysis (summer 2026, on the BSc transcript).

BSc Mathematics, completed in the standard six semesters (most courses in five) while working — *Oct 2023 – Jun 2026*

- Grade 1 (best Austrian grade) in Mathematical Finance (lecture and proseminar), Applied Machine Learning (lecture and proseminar), the Analysis 1 and Analysis 2 lectures, and the Bachelor seminar, which includes the thesis.
- Thesis: *Quantum Neural Networks: Theory and Application for Financial Time Series Forecasting* (supervisor Priv.-Doz. Dr. Lukas Exl); the QNNs did not beat naive baselines, reported as a negative result · github.com/AlphaShk/qnn-financial-forecasting

AWARDS

Jugend forscht 2023 (team of two): Saxony-Anhalt state final 2nd prize and Carl Zeiss special prize, regional 1st place · **10 mathematics and physics olympiad prizes**, 6 first (Chernihiv city and oblast, 2018–2021) · final-stage participant, All-Ukrainian Internet Physics Olympiad 2021/22 · **Vienna Integration Bee:** live phase 2024, qualified 2025 · **Gold Medal**, Lyceum No. 15, Chernihiv (2023).

SKILLS

AI engineering: agentic pipelines (Copilot CLI, MCP, agents, skills), LLM APIs, hybrid retrieval, evaluation harnesses, Ollama.
Programming: Python (pandas, NumPy, PyTorch, scikit-learn, statsmodels, Qiskit), Rust, Go, TypeScript, Java, SQL, Natural.
Systems: Kafka, NATS, Redis Streams, ClickHouse, PostgreSQL, FastAPI, React, Docker, Linux/systemd, CI/CD, z/OS/TSO.
Quant and maths: purged CPCV, deflated Sharpe, PBO, HAC; stochastic calculus, martingale optimal transport, stochastic volatility.
Languages: Ukrainian (native), English (C1), German (C1, Goethe-Zertifikat).