Aleksei Nikolaev, PhD

Tech Lead / Engineering Manager — Fintech & Crypto Backend · AI-Native Engineering

ilc@xhns.org · github.com/xhns · Ulyanovsk, Russia (remote; open to extended on-site stints / relocation) · ORCID 0000-0003-2730-8470 · Live work: https://demo4.xhns.org · https://demo5.xhns.org · https://demo9.xhns.org

SUMMARY

Hands-on engineering lead with 15+ years in software (20+ incl. early freelance), a PhD in theoretical physics and four years of international research experience (South Africa, Germany). Until Aug 2026 led engineering at a crypto exchange (team lead, full-stack incl. Flutter mobile): high-load transactional systems (Java/Micronaut, Kafka, PostgreSQL), and a self-built custody stack (TRON node, signer, ledger) that replaced a third-party provider without downtime. Run development in an **AI-native mode**: architecture, decomposition and code review are mine; the bulk of code is produced by orchestrated AI agents with AI review gates in CI. Proof is public — nine production services at demo.xhns.org…demo9.xhns.org, built solo in weeks.

EXPERIENCE

AWX — crypto exchange (USDT on/off-ramp, B2B/B2C fintech) — Team Lead (full-stack incl. Flutter mobile) / Head of AI Transformation — July 2023–August 2026, remote (company wound down in Sept 2026 due to regulatory changes)

- Own backend architecture of the exchange platform: orders, payment-provider integrations, refunds, reconciliation, anti-fraud holds; Java 21/25, Micronaut, Kafka/Redpanda, PostgreSQL, GraalVM native images, Docker Swarm.
- Designed and shipped **awx-custody**: in-house custodial contour (TRON full node, wallet/signer, gateway, ledger-core, broker bus) replacing an external custody provider; deposit→ledger→withdrawal flows with idempotency and reconciliation on every money path.
- Built an in-house **AML transaction graph for TRON** on top of the full node (address clustering, flow tracing) as a compliance service; KYC onboarding via SumSub, anti-fraud holds.
- Migrated the exchange connector to HTX API v3 with backward compatibility; refactored the Earn service to Kafka-based event flow (Micronaut 5 / Java 25, native image).
- Introduced AI-native engineering: agent orchestration for implementation, AI code review in CI (MR auto-review), evaluation harnesses (classifier accuracy 40% → 100% via named-class prompts), documentation-first context for agents. Team reduced to 4 after restructuring — throughput kept.
- Lead a small team hands-on: decomposition, review, mentoring, release management across test → prerelease → prod.

SimSite LLC — Founder & CEO / Principal Engineer — 2011–Aug 2026 (company wound down Aug 2026), Ulyanovsk

- Web and integration projects for SMBs and a university (Bitrix ↔ 1C, automated staff import pipelines still in production).
- 2025–2026 — applied AI lab: **Artel** (agent team building software from a contract), a claim-store semantic memory for agents, and the public demo line:
  - demo4 — RAG legal consultant with deterministic citation validator and per-answer token/cost display;
  - demo5 — document pipeline: OCR → LLM extraction → grounding check vs source → deterministic matching (300+ tests);
  - demo10 (https://demo10.xhns.org) — Crypto Compliance Consultant: agentic retrieval over MiCA and the EU Travel Rule (2,554 addressable units), every citation verified by code before the answer is shown, honest refusal outside the corpus, per-answer cost in USD (455 tests);
  - demo11 (https://demo11.xhns.org) — custody reconciliation copilot: deterministic on-chain ↔ ledger matching (100% precision/recall on seeded defects, 621 tests), agent explains discrepancies with every figure grounding-checked;
  - demo9 — AI sales assistant over a real ~300-SKU catalogue, idea → public production in one day; demo6 — AI analyst over sales data; demo8 — 2.5D platformer with AI-generated assets.
- Stack: Python/FastAPI, TypeScript, Flutter/Dart, local inference (Ollama on RTX 3090, Qwen-VL OCR), MCP tooling, Claude/OpenAI/DeepSeek APIs.

Ulyanovsk State Pedagogical University — Associate Professor (part-time), Dept. of Mathematics & Physics — 2011–present

- Theoretical physics and mathematical methods; supervised student projects; built and maintain university integration systems.

University of KwaZulu-Natal, Durban, South Africa — Postdoctoral Fellow, School of Mathematics, Statistics & Computer Science — 2018–2021

- Research on modified gravity and embeddings with Prof. S. D. Maharaj; publications in EPJ C, Nucl. Phys. B, MPLA. Earlier: research visit to the Astrophysics & Cosmology Research Unit (2016).

Zentrum für Astronomie, Heidelberg University, Germany — Research trainee — 2014 (10 months, Russian President's scholarship)

EDUCATION

- **PhD, Theoretical Physics** — Peoples' Friendship University of Russia (RUDN), 2016. Thesis: *New cosmological consequences of modified theories of gravity*.
- **Diploma (MSc-equivalent), Physics & Informatics** — Ulyanovsk State Pedagogical University, 2011.
- **Diploma, Economics (Financial Management)** — Ulyanovsk State University, 2011.

PROFESSIONAL DEVELOPMENT

- **NLP / Natural Language Processing** — OTUS (Moscow), 102 academic hours, Jan–Jun 2025; state-format certificate of advanced training No. 773401229027. Capstone: *Optimizing user-request handling in online support via an AI microservice*.

SELECTED PUBLICATIONS (≈15 TOTAL; 6 IN PEER-REVIEWED INTERNATIONAL JOURNALS)

- Nikolaev, Maharaj — *Embedding with Vaidya geometry*, **Eur. Phys. J. C** (2020)
- *Kinetic scalar curvature extended f(R) gravity*, **Nucl. Phys. B** (2018)
- *Exact solutions for scalar field cosmology in f(R) gravity*, **Mod. Phys. Lett. A** (2017)
- *Development of Zeldovich's approach for cosmological distances measurement*, **Eur. Phys. J. C** (2015)
- Nikolaev (sole author) — *Universal cosmological solutions in Lovelock gravity*, **Eur. Phys. J. C** 85, 25 (2025)
- Nikolaev, Zhuravlev, Chervon — *Cosmological dynamics based on Lovelock's gravity. Qualitative analysis* — EPJ C, under review after revision (2026)
- Talks at GR22 (Valencia), BRICS AGAC, SAMS congresses, Friedmann seminars.

SKILLS

Backend: Java (Micronaut, GraalVM native), Kotlin, Python (FastAPI), TypeScript/Node, Go, Rust (working), Perl (expert), Dart/Flutter.

Data & infra: PostgreSQL, MySQL, Kafka/Redpanda, Meilisearch, Docker/Swarm, GitLab CI, Linux (Slackware, from-source), Caddy/nginx, WireGuard.

Crypto/fintech: exchange connectors (HTX/Huobi), TRON/USDT custody, ledgers, reconciliation, AML transaction graph, KYC (SumSub), payment webhooks & disputes.

AI engineering: LLM agents & orchestration, RAG with grounding/validation, MCP servers, prompt/eval harnesses, local inference (Ollama, Qwen, Whisper), Claude Code / Codex workflows.

Leadership: small-team leadership, architecture reviews, hiring, documentation-first process.

Languages: Russian (native), English (professional working — 3 years living/working in South Africa, 1 year in Germany), German (basic).