

Fedor Vikhnin

SOFTWARE ENGINEER · CORE INFRASTRUCTURE, COMPILERS & SERIALIZATION

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Experience

VK Group

Saint Petersburg

SOFTWARE DEVELOPER

Oct. 2023 - current

- **Description:** Part of the Core Infrastructure Team. Work on **low-level infrastructure** for **cross-service communication** in the core product. Project: github.com/VKCOM/tl.
- **TL2 (2025 - current).** Designed and implemented TL2 from scratch and drove it to company-wide production adoption — a **backward-compatible serialization protocol** and type language for VK's microservice migration: **language frontend**, **AST**, generated **ser/de** architecture, and **Go and PHP code generation**.
- Introduced **schema-evolution mechanisms**: **uniform union** representation, **field masks**, **structure sizes**, skippable unknown data, default handling, compact **bit** type.
- **Led the production migration from TL1 to TL2**: built **migration tooling** and **percentage-based rollout** at service / RPC-method level. Rollout of major high-load services was **fully transparent to production — zero incidents, no performance regressions**; **TL2 now serves ~90% of TL-related RPC traffic** (~500 namespaces, hundreds of thousands of generated lines of code), with the remaining long tail of smaller services migrating team by team.
- **Enabled independent service deployments**: protocol-level backward / forward compatibility removed the need for administrative release coordination between teams in the microservice ecosystem.
- Optimized Go runtime: kept TL2 **within ~1.5x of TL1** while **3–5x faster than Protocol Buffers** on representative read/write benchmarks; production-hardened through **profiling, fuzzing, stress and compatibility testing**.
- Improved developer experience and internal adoption: built a **VS Code extension** for the TL2 language and integrated TL2 into company-wide development workflows.
- **TL1 ecosystem (2023 - 2025).** Owned TL1 **code generation for PHP and C++** (built the C++ serializer from scratch); modernized JSON integration (**2–3x performance**, lower memory).
- **Drove the project's transition to open source on GitHub**, set up CI, expanded test coverage, introduced **partial fuzzing**; **mentored a junior engineer / intern** (onboarding, task decomposition, architectural guidance, code reviews).
- **Tech stack**: Go, C++, PHP, Rust, Bash, Git (GitHub, GitLab).

Huawei R&D

Saint Petersburg

SOFTWARE DEVELOPER

Aug. 2022 - Oct. 2023

- **Description:** Worked on a cross-platform reactive UI framework based on the concept of positional memoization. The framework is written in TypeScript, the render engine is in C++. A team of 13 people.
- **Lead team developing a gesture system**: implementation of signal reception, processing architecture at the framework level and logical recognition control
- **Created of a demo application** in which the capabilities of the framework had been explored, areas of development and evaluation of user experience were identified
- Developed range of components
- Managed team, reviewed code
- **Technological Stack**: TypeScript, Java 8, C++, Android, Skia, GLFW, JNI, V8, Docker, git (GitLab)

Yandex.Direct

Saint Petersburg

SOFTWARE DEVELOPER

Aug. 2021 - June 2022

- **Description:** Worked on the contextual advertising system on Yandex pages and Yandex advertising system partner sites.
- Developed a test framework for integration testing of cases of using "smart strategies" - a system of targeting settings for advertising campaigns
- API development for interaction with third-party Yandex services (Yandex.Metrica, etc.)
- Developed automatic tasks for log queue analysis in the system
- Maintained multiple repositories and services for accumulating various data on strategies
- **Technological Stack**: Java 11, Kotlin, GraphQL, jOOQ, Postgres / MySQL, Protobuf, Mockito, Spring Boot, Apache Kafka, Docker, git (Arc)

Projects & Tutoring

Typed tool calling, multi-agent benchmark

Private repo, code on request

GO LLM AGENT FRAMEWORK

2025

- Built a **Go MVP framework for LLM agents** with **pluggable model providers**, **typed tool libraries**, and **auto-generated JSON-schema-like tool descriptions**.
- Designed a **multi-agent messenger benchmark**: three agents cooperate by exchanging partial information through asynchronous events to solve a hidden linear system; tracked success, attempts, tool calls, token usage, and cost across several model families.
- Independently converged on an **MCP-like tool-call shape** before MCP became standardized.
- **Tech stack**: Go (generics-based typed tools), OpenRouter.

Semantic notes & LLM memory layer

Private repo, code on request

LIGHTWEIGHT VECTOR DATABASE

2025

- Built a **Go vector store** for personal notes, Telegram voice transcripts, and links, searchable through natural-language queries.
- Designed a **multi-vector object model** with **weighted category relevance** (~5 category embeddings per object) and **get/getK** retrieval via **heap-based top-K linear search**.
- Implemented **mmap-backed persistent storage** with separate vector / reference / value layouts for cache-friendly scanning; prototyped an **HNSW-style ANN index** for the larger-scale case.
- **Tech stack**: Go, Qwen3 Embedding via OpenRouter (4096-dim), Gemini for voice transcription.

ITMO University

TUTOR — MATHEMATICAL LOGIC & PROGRAMMING PARADIGMS

Sep. 2024 - current

- **Two years of teaching practical classes** for second-year students across **Mathematical Logic** and **Programming Paradigms** courses
- **Checked the assignments** and **took part in the exams**
- **Contributed to the development of educational resources** for the curriculum
- **Developed library to generate formal proofs**: [link to github](#)

Education

ITMO University

Saint Petersburg

MASTER DEGREE IN COMPUTER SCIENCE

Sep. 2023 - Aug. 2026

- **Defended master's thesis** with theme "**Development of the TL2 data serialization protocol and a method for phased automated migration from TL1 while preserving system-level compatibility**" — formalizing the production work delivered at VK.
- Studied **Distributed Systems** and **Formal Verification**, Cryptography and Cloud computing
- **Developed educational project** for **Scala Course**
- **Completed the Rust language course** from the Yandex School of Data Analysis

ITMO University

Saint Petersburg

BACHELOR DEGREE IN COMPUTER SCIENCE

Sep. 2019 - Aug. 2023

- Had **GPA** equals to **4.31**
- Nominated for **two years by award for high academic achievements** from Huawei, Serokell и Selectel
- **Defended article with excellent mark** with theme "**Formal verification of the classification of definable functions in simply-typed lambda calculus**". Developed Arend library with various formal proofs for such model.

Physics and Mathematics Lyceum №239

Saint Petersburg

STUDENT

Sep. 2015 - Aug. 2019

- Finished school with **silver medal**
- Became **3 times the winner of the Regional stage of the All - Russian Olympiad in Physics**

Achievements & Awards

English — B2+, IELTS 6.5/9

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| 2022 | Winner of the Academic Achievement Award from Selectel , ITMO University | Saint Petersburg |
| 2022 | Winner of the Academic Achievement Award from Serokel , ITMO University | Saint Petersburg |
| 2021 | Winner of the Academic Achievement Award from Huawei , ITMO University | Saint Petersburg |