Sergey Melnychuk

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Summary

Staff/Principal Software Engineer — Distributed Systems & Infrastructure

Software engineer with 15+ years of experience building and operating large-scale production systems. Background in high-reliability infrastructure, autoscaling, and protocol implementations across Google, Meta, Equinix and Starburst Data. Specialize in distributed systems, performance-sensitive services, and low-level components (Rust/C++/JVM).

Led architecture and delivery of blockchain light clients, autoscaling infrastructure, and large data processing platforms. Experienced technical lead and maintainer of production open-source systems. Focus areas: scalable backends, system architecture, reliability, and performance.

Skills

Languages: Rust, Java, Scala, C++, Go
Distributed Systems: designing and operating RPC services, autoscaling systems, and data pipelines
Infrastructure & Data: Kafka, Spark, Cassandra, PostgreSQL
Cloud & Operations: AWS, GCP, Docker, Kubernetes, CI/CD
Other: performance optimization, debugging production systems, protocol implementation

Experience

05.2025 - Present: Independent Research & Open Source
Designed and implemented Solenoid, an Ethereum Virtual Machine in async Rust — covering the full EVM execution pipeline, opcode semantics, and smart contract execution correctness.
Deepened expertise in ZKP systems and zkVM architectures (SP1, Noir) through hands-on research and coursework.
Completed ZKP-focused study of Ethereum state proof verification and cross-chain interoperability patterns

09.2022 - 05.2025: Eiger (Senior Software Engineer / Tech Lead, Contract)
Lead engineer for Beerus, a Rust-based light client for the Starknet blockchain:
- Took ownership of an under-maintained project and performed major architectural rewrite improving maintainability and reliability
- Designed and implemented stateless contract execution support
- Built RPC specification–driven code generation tooling (iamgroot) to reduce manual maintenance and simplify protocol upgrades.
- Delivered WebAssembly client and public demo application
- Introduced CI improvements and expanded automated testing
- Led technical direction and coordinated work of multiple engineers and stakeholders
- Implemented and deployed Ethereum smart contracts (Solidity)

Maintainer of Pathfinder, a Rust-based Starknet full node:
- Implemented OpenRPC API methods and participated in production debugging and issue triage
- Prototyped block synchronization engine and indexing storage (armada)

04.2022 - 09.2022: Meta (Facebook) (Senior Software Engineer | L5, Full-Time)
Service Health (C++, Python, JavaScript, React, Rust)

06.2021 - 03.2022: Starburst Data (Senior Software Engineer, Full-Time)
Contributed to Trino (Java, Maven, GitHub)

11.2019 - 06.2021: Equinix (Staff Software Engineer, Full-Time)
Big Data Analytics, Internet of Things (Java, Scala, Akka, Kafka, Spark, AWS)

07.2018 - 10.2019: Google (Software Development Engineer | L4, Full-Time)
- Contributed to Autopilot autoscaling and resource management system responsible for dynamic scaling of workloads
- Worked on production infrastructure services in Google Cloud Platform
- Developed components in C++ for high-reliability resource management
- Focus on reliability, performance, and production debugging in large-scale distributed environment

07.2014 - 07.2018: StrikeAd (acq. by Sizmek) (Senior Scala Developer, Full-Time)
RTB DSP development: high-load, big-data (Erlang, Scala, Java, Python, AWS)
Leading a cross-functional feature-team of up to 6 software engineers.

06.2013 - 06.2014: EPAM Systems (Senior Java Developer)
09.2012 - 06.2013: EngagePoint (Java Developer)
05.2011 - 09.2012: Infopulse (Java Developer)
02.2010 - 05.2011: Infopulse (Junior Java Developer)

Education

2010 - 2012: Master's Degree, Computer Science
2006 - 2010: Bachelor's Degree, Computer Science
NTUU "KPI", CAD / System Design (Kyiv, Ukraine)

Certifications

Zero-Knowledge Bootcamp (RareSkills, 2024)
Cardano Blockchain Certified Associate (Cardano Academy, 2024)
Architecting with Google Kubernetes Engine (Google, 2022)
Reactive Architecture Specialization (Lightbend, 2021)
Functional Programming with Haskell (Stepic, 2020)
Apache Cassandra 3.x Developer Associate (Datastax, 2020)
Algorithms I & II by Robert Sedgewick (Princeton/Coursera, 2018)
Deep Learning Specialization by Andrew Ng (Coursera, 2018)
Functional Programming in Scala Specialization (EPFL/Coursera, 2018)
Oracle Certified Professional: Java SE 6 Programmer (Oracle, 2011)

Languages

English (fluent), Polish (fluent), Ukrainian (native)

etc

Personal technical blog.
Full Advent of Code solutions: 2020, 2021, 2022