Nikolay Kurtov

Senior Software Engineer at Irreducible.com

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Summary

Seasoned C++/Rust engineer with deep expertise in high-performance computing, large-scale distributed systems and FPGA acceleration.

Experience

System SW / Cryptography Engineer - Irreducible.com 2024 - Present

- Wrote the Xlang compiler, enabling users to define a program's Intermediate Representation; Xlang generates code for custom hardware cores, achieving up to 99.5% utilization through software pipelining.
- Achieved x12 speed up of Binius Sumchecks and Zerochecks using FPGA: (https://gitlab.com/IrreducibleOSS/binius)
- Directed a junior team member to exploit parallelism in Evalcheck, boosting performance of Evalcheck x15.
- Designed and deployed the software stack bridging Binius and FPGA drivers in production.

Tech Lead - Node Team - NEAR Protocol 2021 - 2023

- Re-architected State Sync, increasing reliability and performance: https://gov.near.org/t/protocol-reinventing-state-sync/34567
- Reduced release incidents and improved community validator experience
- Enhanced node monitoring with advanced metrics, logs, and tracing (Grafana Tempo)
- Code contributions: https://github.com/nikurt

Senior Software Engineer at Google 2011 - 2021

- Tech Lead, YouTube Core SRE (2.5 years)
-   - Drove end-to-end reliability initiatives for YouTube, boosting success metrics.
-   - Led a C++ microservice dependency management framework and production readiness process.
- Knowledge Graph Infrastructure (3 years)

- - Built and optimized critical backend components, improving throughput and reliability.
  - - Designed APIs to help internal teams leverage Knowledge Graph data.
- Knowledge Graph Quality (1 year)
  - - Improved ML models for music entity reconciliation, impacting 0.3% of Google search traffic.
- Geo Logs and Data Quality (1 year)
  - - Designed an ML system to eliminate duplicate business listings in Russia and Vietnam.
  - - Extracted new usage metrics for product teams, improving feature development.
- Google Offers (2 years)
  - - Developed a personalized offers system (email + online distribution).

Software Engineer at Intel 2010 - 2011 Optimized Intel C++ Compiler for CPU2000 and EEMBC1.1 on Atom

Intern Software Engineer at Intel 2008 - 2010 Developed a distributed memory runtime for Intel Concurrent Collections for C++.

Intel Student Laboratory 2008 Added edge profiling support to the Apache Harmony Jitrino.JET compiler.

xored software 2007 QA, CI, and administered Debian servers

SWSoft Student Laboratory 2006 Created a 3D physics engine and handled level generation/sound for a game

Skills

- Languages: Rust (4 yrs), C++ (14 yrs), Python (3 yrs)
- Expertise: High-performance computing (FPGA), SRE, blockchain protocols, distributed systems
- Core Competencies: Data structures & algorithms, parallel/distributed programming, large-scale systems design

Education

MS in Computer Science, 2009 - 2011 Novosibirsk State University. GPA 5.00 (100%)

BS in Computer Science, 2005 - 2009 Novosibirsk State University. GPA 5.00 (100%)

Hobbies

- Swordfighting (HEMA). Assistant Coach. https://hemaratings.com/fighters/details/12545/
- Running, Marathon personal best time - 3h25m
- Astronomy. Built a solar projection telescope

Programming Competitions

1. 14th place at the ACM ICPC World Finals 2010 in Harbin
2. 27th place at the ACM ICPC World Finals 2011 in Orlando
3. 11th place at the Yandex Open 2010 onsite round