GEORGY DUNAEV

Senior Formal Methods & Logic Systems Engineer · Berlin / Potsdam, Germany
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Senior Software Engineer & Mathematician specializing in formal methods, automated reasoning, high-assurance systems (OCaml, Standard ML, C++, Python), and multi-agent autonomous engineering. Author of peer-reviewed mechanization in the **Archive of Formal Proofs (Isabelle/ZF)**. Architect of the Obelisk Proof Assistant with verified sequent calculus and de Bruijn indices. M.Sc. in Computer Science (Lomonosov MSU) and M.Sc. Candidate in Mathematics (University of Potsdam).

Formal Provers: Isabelle/ZF, Rocq (Coq), Lean 4, HOL4, SMT (Z3), TPTP

Languages: OCaml, Standard ML, C++, Python, Bash, Rust, JavaScript

Foundations: Sequent Calculus, Morse-Kelley, Category Theory, Model Theory

Systems & AI: Multi-Agent Orchestration, Docker Networking, Zero-Leak CI/CD

SELECTED PROFESSIONAL & RESEARCH EXPERIENCE

Lead Architect & Formal Methods Researcher — Obelisk Proof Assistant (2020 – 2024)
- Designed standalone theorem prover kernel in Standard ML with verified sequent calculus and de Bruijn indices.
- Mechanized Morse-Kelley class theory, Gödel incompleteness metatheory, and Yoneda Lemma.
- Published peer-reviewed formalization *Recursion Theorem in ZF* in Archive of Formal Proofs (Isabelle/ZF).

Software Developer (OCaml / Backend) — BI.ZONE Virtualization Systems (2019 – 2020)
- Built distributed virtualization control plane backend in asynchronous OCaml; managed Linux isolation.
- Designed automated test harnesses and static analysis checkers for high-reliability C++ and Python services.

Verification Researcher & Smart Contract Developer — Cryptographic Start-up (2017 – 2019)
- Developed and verified state-machine invariants for smart contracts using SMT solvers (Z3) and code-generation.
- Modeled cryptographic protocols ensuring absence of reentrancy and integer overflow vulnerabilities.

Teaching Assistant in Mathematics — University of Potsdam (2024 – 2025)
- Led mathematical logic and analysis tutorial sessions in German and English for university undergraduate students.

EDUCATION & PEER-REVIEWED PUBLICATIONS

M.Sc. Mathematics (Candidate) — Univ. Potsdam (2024–Pres.)

M.Sc. Computer Science — Lomonosov Moscow State Univ. (2017–2019)

B.Sc. Applied Mathematics — Bauman MSTU (2012–2016)

Archive of Formal Proofs: *Recursion Theorem in ZF* (Isabelle/ZF)

Master's Thesis: Foundations Mechanization in Rocq (Coq)

Status: Work Auth (140 days/yr); Blue Card / §18b Eligible (Anabin H+)