

Georgy Dunaev

Software Engineer · Formal Verification & Proof Assistants

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Profile

Mathematician and software developer specialising in formal verification and interactive theorem proving. Two master's degrees (mathematics, computer science), three years of industry experience in OCaml backend development, smart-contract verification and embedded R&D, and an independently developed LCF-style proof assistant. Seeking a position in [\[formal methods / software verification / functional programming\]](#) in Germany.

Professional Experience

09/2024 – 04/2025 Teaching Assistant (Tutor)

Institute of Mathematics, University of Potsdam, Potsdam

- Ran weekly exercise classes and graded assignments for [\[course name, e.g. Linear Algebra I\]](#).

08/2020 – 09/2024 Independent Researcher and Developer, formal verification

Personal projects, [\[Moscow / Potsdam\]](#)

- Designed and implemented the *Obelisk* proof assistant (see Projects).
- Formalised results from set theory and first-order logic in Isabelle, Rocq (Coq) and HOL4.
- Relocated to Germany in MM/YYYY; German language courses to B1 (Zessko, 2024).

06/2019 – 07/2020 Software Developer (OCaml)

BI.ZONE, Moscow – cybersecurity company

- Developed the backend of a distributed system built on Linux virtualisation technologies.
- Wrote asynchronous OCaml code, test cases for C++ and Python components, and CI/CD test scenarios for the test bench.

04/2017 – 04/2019 Developer / Researcher

"StartUP", blockchain start-up, Moscow

- Developed and formally verified smart contracts using code-generation methods.
- Contributed to blockchain and backend development.

12/2015 – 12/2016 Junior Engineer, R&D Department

LG Electronics, Moscow

- Developed applications and firmware for device prototypes (STM32 microcontrollers).
- Collected and processed image data of fingerprints, eyes and material surfaces.
- Built 3D demo scenes and adapted visualisation for the Oculus Rift headset.

03/2015 – 04/2015 Junior Programmer

Geliosoft, Moscow

- Maintained a software product with a large legacy code base.

Education

10/2024 – [\[2026\]](#)

M.Sc. Mathematics

University of Potsdam, Faculty of Science, Institute of Mathematics

Thesis: [\[title\]](#). Final grade: [\[x.x\]](#).

09/2017 – 06/2019	M.Sc. Computer Science Lomonosov Moscow State University, Faculty of Mechanics and Mathematics, Department of Mathematical Logic and Theory of Algorithms Thesis: [title]. Final grade: [x.x] [Russian scale, 5 = best].
09/2012 – 06/2016	B.Sc. Applied Mathematics Bauman Moscow State Technical University (National Research University), Faculty of Fundamental Sciences Thesis: [title]. Final grade: [x.x].

Projects and Publications

2019 – 2026	Obelisk Proof Assistant obeliskproofassistant.github.io LCF-style proof assistant for Morse–Kelley class theory with a higher-order-logic variant; implemented in StandardML. Personal project: design, implementation, documentation.
2018 – 2024	Formalisation of classical foundations of mathematics Rocq (Coq), Isabelle – github.com/georgydunaev • Soundness and completeness of classical first-order logic. • Verification of the ZFC axioms in a model of classes inside the Calculus of Inductive Constructions with classical axioms. • Theorems from Jech's <i>Set Theory</i>; metatheory around Gödel's incompleteness theorems (diagonal lemma, Löb's theorem). • Contextual categories, towards a categorical semantics of Homotopy Type Theory, using the UniMath/HoTT library.
05/2020	Publication: Recursion Theorem in ZF Archive of Formal Proofs (Isabelle/ZF) – isa-afp.org/entries/Recursion-Addition.html Mechanised proof of the recursion theorem following Hrbacek and Jech, as a basis for modelling Peano arithmetic in ZF.

Skills

Proof assistants	Isabelle/HOL, Isabelle/ZF, HOL4, HOL Light, Rocq (Coq), Lean, Metamath, Hoq
Languages	Standard ML (Poly/ML, CakeML), OCaml – primary; C++ (STL, OpenGL, MPI, OpenMP, CUDA, WinAPI), Python (pytest) – working; JavaScript, TypeScript, Node.js – basic
Tools	Linux, Bash, Make, Git, Docker, CI/CD, GDB, LaTeX; MATLAB, Wolfram Mathematica, Maple; Jira, Confluence, Redmine

Languages

German	B2 (working proficiency; B1 certificate, Zessko, University of Potsdam, 2024)
English	C2 (fluent; IELTS C1 certificate, 2020)
Russian	Native

Personal Details

Date of birth	[DD.MM.]1993, Moscow
Nationality	Russian
Residence status	[Residence permit type, valid until 06/2027; unrestricted work authorisation]