Vasily Ilin

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Education

University of Washington │ 2020 - 2026

Applied Mathematics, PhD, $15,000 in awards.
Cofounder & Deputy Director of the Math AI Lab, $86,000 in funding.

Boston University │ 2015 - 2020

Computer Science, MS.
Mathematics, BA & MA (Magna Cum Laude). Thesis: "Stochastic Simulation Algorithms and Benchmarks", paper.

Skills

Technical Skills: Python, Jax, HPC, PyTorch, WandB, SQL, Julia, Java, Lean, cluster computing
CS & Math Skills: AI for Math, deep learning, plasma modeling, data engineering, diffusion, sampling, formalization

Work Experience

Consultant at Math.Inc │ October 2025

Accelerating math research and math formalization with AI agents.

AI Intern at Google Cloud │ Summer 2025

Improved a Slides2Video model with a multi-agentic APO algorithm. Achieved F1 score of 0.9. Collaborated with two teams in Google DeepMind. Gave 6 research talks. Was acknowledged in a memo to 4 Vice Presidents and 3 Directors.

ML Intern at Google Cloud (Python, SQL) │ Summer 2024

Trained XGBoost to predict defective TPUs from HBM ECC telemetry, achieved 80% accuracy and improved test efficiency 4x.

ML Intern at YouTube (Python, C++, SQL) │ Summer 2023

Trained model to achieve a 2x Egress/Ingress improvement in a CDN. Proposed and implemented a load balancing algorithm.

Data Engineering Intern at Android, Google (Flume Java, SQL) │ Summer 2022

Built a distributed pipeline for Quick Share, from logs to dashboards. Sped up dashboards by 30x using approximate aggregation.

Google Summer of Code (Julia) │ Summer 2021 │ code, blog post

Implemented, tested, benchmarked, and optimized algorithms to simulate jump processes. Sped up simulations by 70%.

Leadership

Cofounder & Deputy Director of UW Math AI Lab (Lean, LLMs) │ 2022-present │ Github org, website

- Submitted two papers to ICML 2026: Lean with LLMs and Theorem search.
- Ran the Lab independently during the Director's sabbatical; designed and taught UW's first Lean course (MATH 480).
- Built UW's Lean community from zero to 30+ active users; taught Lean to 200+ students and 3 faculty members.
- Contributed nine lemmas to `mathlib` with Lab students. PRs: 19798, 19896, 19886, 32824.
- Created the Math AI Seminar and organized 15 talks; delivered invited talks at JMM 2025, Lean workshop, and Google.
- Secured $86,000 in Lab funding (grants from UW, Google, Nebius, and individual donations).
- Mentored or administrated 63 projects involving 185 undergraduates, 17 graduate mentors, and 10 faculty mentors.
- Built Lab recruiting and community infrastructure: GitHub organization, LinkedIn organization, Lab logo, and Instagram advertising; generated 150 applications in one quarter.
- Supervised the Lab's most popular research projects, including a theorem-search project with 70 applicants.
- Supported student research dissemination: UW Undergraduate Symposium presentations; coauthored submission to Math4AI Workshop at ICML 2025.

Organizer of plasma and ML seminars │ 2024-present

- Organized PlaSMoS (plasma simulation and modeling seminar); delivered three talks.
- Helped organize MLJC (machine learning journal club); delivered one talk.

Publications

Semantic Search over 9 Million Mathematical Theorems │ 2026 │ submitted to ICML

A dataset of 9 million theorems from arXiv, and semantic search outperforming Google and LLM search by 50%.

Learning to Repair Lean Proofs from Compiler Feedback │ 2026 │ submitted to ICML

A dataset of 260k erroneous Lean proofs, compiler feedback and corrections. Outperforming Goedel-32B in error correction.

CayleyPy-4: AI-Holography. Towards analogs of holographic string dualities for AI tasks │ 2026 │ submitted to ICML

A holographic duality framework mapping Cayley graph complexity to geometry. New conjectures and AI-assisted algorithms.

DiScoFormer: Plug-In Density and Score Estimation with Transformers │ 2025 │ **pre-print**

A symmetry-equivariant KDE-inspired transformer for density and score estimation, significantly outperforming KDE.

Stability of the homogeneous Landau equation in relative entropy and applications to score-based methods │ 2025 │ **pre-print**

A proof of relative entropy stability of the Landau equation with applications to accuracy of score-based particle solvers.

Score-Based Deterministic Density Sampling │ 2025 │ **ICLR workshop, CPAA** │ **paper**

Deterministic sampling of an unnormalized density using on-the-fly score estimation with a neural network.

RealEdit: Reddit Edits As a Large-scale Empirical Dataset for Image Transformations │ **CVPR, 2025** │ **project page**

A dataset and diffusion model to perform text-guided image edits. The first global edit model trained on real data.

Transport Based Particle Methods for the Fokker-Planck-Landau Equation │ **CMS, 2025** │ **paper**

An algorithm for simulation of plasma using a neural network, inspired by score-based generative modeling.

Community and Mentorship Through the Experimental Lean Lab │ **JMM, 2025** │ **abstract**

We share lessons we've learned in building community and mentoring undergraduate research projects in Lean.

Extending `JumpProcesses.jl` for Fast Point Process Simulation with Time-Varying Intensities │ **JuliaCon, 2024** │ **paper**

An algorithm to efficiently simulate any point process on the real line with a continuous intensity rate.

Catalyst: Fast Biochemical Modeling with Julia │ **PLOS Comp Bio, 2024** │ **paper**

Julia library for modeling and high-performance simulation of chemical reaction networks.