ALEKSANDR FEDCHIN

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PROFILE

PhD candidate in Computer Science with experience in automated reasoning, verification of MPI-based parallel software, machine learning, and systems-level development. Multiple internships at AWS.

EDUCATION

Tufts University M.S. 2022, CS Ph.D. Candidate, 2020 – Present (Expected Ph.D. Fall 2025)

Advisor: Jeffrey Foster
Current Work: Verification of scientific software that uses Message Passing Interface for parallel computing
Awards: Amazon Post-Internship Graduate Research Fellowship (2022)

Bard College B.A. in Computer Science, B.A. in Classical Philology, 2016 - 2020

Thesis: Predicting Imports in Java Code with Graph Neural Networks

INDUSTRY EXPERIENCE

Amazon Web Services – Applied Scientist Intern Summers of 2021, 2022, 2023; Sep 2023 - Apr 2024
Mentors: Lucas Wagner and Zvonimir Rakamarić

Worked on and maintained several features of the Dafny and Boogie programming languages, including counterexample generation, automated testing, and coverage reporting. Results have been published in NFM 2023 and TACAS 2022, presented at POPL 2024, and described on the official Dafny blog.

JetBrains – YouTrack ML Intern Summer 2019
Mentors: Vitaly Khudobakhshov and Denis Litvinov

Developed a machine-learning pipeline for automatic categorization of issue tracker tickets. Compared several neural network architectures, approaches to multi-task learning, meta-learning, etc.

SKILLS

Verification Tools	Rocq/Coq, Dafny, Boogie, Weakest Precondition Calculus, etc.
Parallel Computing	Research experience in verifying correctness of MPI-based scientific software.
Developer Tools	Linux, Git, CI (GitHub Actions), Code review, VS Code, JetBrains IDEs, etc.
Machine Learning	PyTorch, NumPy; practical experience training and deploying models (JetBrains).
Languages	C#, Python, Java, Dafny > C, C++, ML, Kotlin > Prolog, Ruby etc.

PUBLICATIONS

[**In Review**] **Fedchin, Mejr, Sundar, Foster:**
***DafnyMPI: A Dafny Library for Verifying Message-Passing Concurrent Programs*. POPL, 2026**

Fedchin, Bai, Foster:
***Metamorph: Synthesizing Large Objects from Dafny Specifications*. OOPSLA, 2025**

Fedchin, Dean, Foster, Mercer, Rakamarić, Reger, Rungta, Salkeld, Wagner, Waldrip:
***A Toolkit for Automated Testing of Dafny*. NFM, 2023**

Chakarov, Fedchin, Rakamarić, Rungta: ***Better Counterexamples for Dafny*. TACAS, 2022**

Fedchin, Cooperman, Chaudhuri, Dexter:
***Probabilistic Identification and Ranking of Acrostics in Multilingual Corpora*. NAACL, 2025**

TEACHING EXPERIENCE

Discrete Mathematics (Tufts, 2024), Introduction to Automated Deduction (American University of Central Asia, 2024), Programming Languages (AUCA, 2025), Introduction to Artificial Intelligence (AUCA, 2025)