

# ALEKSANDR FEDCHIN

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## PROFILE

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Berlin-based computer scientist with a PhD in CS from Tufts University (defended October 2025) specializing in programming languages and verification, most recently of concurrent MPI software. Industry experience through multiple internships at AWS and JetBrains. Authorized to work in Germany via Chancenkarthe.

## EDUCATION

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**Tufts University (advisor: Jeffrey Foster)** PhD 2025, M.S. 2022

Thesis: Expanding the Capabilities of Automated Program Verifiers for Testing, Synthesis, and Concurrency  
Awards: Amazon Post-Internship Graduate Research Fellowship (2022)

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

## INDUSTRY EXPERIENCE

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

Worked on the Dafny programming language in close collaboration with the team that used Dafny to help **rewrite and optimize the Java backend of the AWS Cloud-Scale Authorization Engine**. Specifically, I designed and maintained the counterexample generation, automated test generation, and coverage reporting features of Dafny. 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

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<b>Languages</b>	C#, Java, Python, Dafny > C, C++, ML, Kotlin > Prolog, Ruby etc. English (native), Russian (native), German (intermediate reading), Latin, Ancient Greek
<b>Parallel Computing</b>	Experience in formally verifying correctness of MPI-based scientific software.
<b>Verification Tools</b>	Rocq/Coq, Dafny, Boogie, Weakest Precondition Calculus, etc.
<b>Machine Learning</b>	PyTorch, NumPy; practical experience training and deploying models (JetBrains).
<b>Developer Tools</b>	Linux, Git, CI (GitHub Actions), Code review, VS Code, JetBrains IDEs, etc.
<b>Language Design</b>	Reflection (Java, C#), compilers, type systems, functional programming, concurrency

## PUBLICATIONS

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[Conditionally Accepted] 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

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