

Ivan Grigorik

Ph.D. Student at UT Austin

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Research Interests

High Performance Computing, Compilers, Debuggers, and AI for SE

Education

- 2024 - present **Ph.D.**, *The University of Texas at Austin*, GPA: 3.9
Major in Software Engineering and Systems, advised by Milos Gligoric.
- 2020 - 2024 **B.S.**, *Belarusian State University of Informatics and Radioelectronics*, GPA: 3.7
Major in Computer Science and Network Engineering

Experience

- 2024 - present **Graduate Research Assistant**, *University of Texas at Austin*
Software Validation, Compilers and High Performance Computing
- Implemented a debugger for HPC eDSL with $\leq 2.33\times$ overhead compared to pdb, Python's native debugger;
 - Developed static and dynamic analyzer tools for the existing programming language on top of its infrastructure;
 - Main developer and maintainer of PyKokkos, contributor of Kokkos;
 - Research ML for HPC optimizations, HPC eDSLs, and Python-to-C++ interoperability.
 - Research compiler optimization techniques, source code processing, and code testing tools;
- Summer 2026 **PhD Intern**, *Oak Ridge National Laboratory*, [pyArborX](#)
- Designed and built a JIT compiler translating Python into C++ for ArborX, an HPC spatial-search library.
 - Deployed a custom AST parser and py2many-based code generator for ArborX's template-heavy C++ APIs.
 - Implemented a pybind11 module generator that enables JIT compilation and delayed template specialization.
 - Validated framework by implementing ML clustering algorithms and deploying CIs for correctness checking.
- Spring 2024 **Research Assistant**, *BSUIR*
Led the research on wireless communication technology
- Conducted in-depth research on the topic of harmonic oscillations and total harmonic distortion between signals in wireless networks;
 - Developed and tested the PCB for jamming Bluetooth and WiFi devices in the shielded lab;
 - Contributed to 3 different research projects over 5 months.
- Summer 2023 **Software Developer Intern**, *AGAT - Control Systems*
Contributed to multiple network tools for the company network.
- Developed network controlling and monitoring software for Cisco and Dell equipment.
 - Implemented and designed network analysis tools for the company's local network.
 - Collaborated with the team to deploy an improved network management system.

Publications

- SC '26 **Ivan Grigorik**, Gabriel Kosmacher, George Biros, Milos Gligoric
Interactive Debugger for Performance Portable Python HPC Kernels
- SciConf '24 **Ivan Grigorik**, Diana Kupriyanova
Active jammer stations based on direct influence noises

Skills

- Languages C, C++, Python, Rust, ASM, Java, Bash, SQL;
- Tools GCC, LLVM, Make & CMake, CUDA, GDB, Valgrind, Docker, STL;
- Domains Compilers, HPC, Static and Dynamic Analysis, Verification of Software;
- Concepts System and Software Engineering, Program Testing, Sanitizing and Profiling, Design Patterns, Distributed Computing, Parallel Algorithms, Multithreading, Computer Architecture, Networking;

Services and event participation

2026 CGO '27 – artifact evaluator.
UT '26 – PhD student participant in faculty hiring process.
OOPSLA '26 – sub-reviewer.

2025 CGO '25 – sub-reviewer

Presentations

2026 SC '26: Interactive Debugger for Performance Portable Python HPC kernels

2026 AMD iMAGiNE Symposium.

2026 Predictive Science Academic Alliance Program (PSAAP) presentation: PyKokkos ecosystem and development cycle.

2026 High Performance Software Foundation (HPSF) presentation: Pythonizing PyKokkos.

2025 AMD iMAGiNE Symposium.

2024 - 2026 Co-organized the Joint UT-Cornell Software Engineering Seminar Series.

Projects

xbash A fork of bash with static and dynamic analysis tools and extended builtins.

cuRTX Open-source ray tracing tool written in CUDA and C++, inspired by RTX-in-one-weekend book.

GameOfLife Pet-project, Conway's Game of Life written in C++ and SFML.

HvC Fork of HIPIFY that compares heterogeneous computing platforms (CUDA, HIP, etc.).

PyKokkos Framework for writing high-performance Python code similar to Numba. *Current maintainer.

Honors and awards

2024 Graduate School Fellowship, University of Texas at Austin.

2024 Outstanding paper of BSUIR 60th SciConf24

Paper: Active jammer stations based on direct influence noises.