Caspar Popova
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Education

University of Maryland, Ph.D in Computer Science — College Park, MD; 2024 - Present
Northwestern University, Bachelor of Science in Computer Science — Evanston, IL; 2019 - 2022
Relevant coursework: PL + Architecture (HLS), Compilers (Garbage collection, abstract interpretation), Theorem proving (Roq, Lean), PL + Security, Databases

Ongoing Research

Sized Types for Program Generation — May 2025 - Present
Random testing compiler transformation by focusing on recursion optimization, such as recursion elimination, and developing a program generator using sized types to ensure termination.
→ Random Testing, Compiler Testing, OCaml, Racket

Research Experience

PLUM Lab, University of Maryland — College Park, MD; Aug 2024 - May 2025
Researching property based testing tools for Racket contracts by contrasting existing PBT techniques and evaluating existing generation tools for contracts.
→ Property Based Testing, Contracts, Racket

PLT Group, Northwestern University — Evanston, IL; 2021-2022
Designed and implemented an SMT solver-based program synthesizer for higher-order functional programs to evaluate the usefulness of error-reporting mechanisms in gradually typed languages including Typed Racket.
→ Program Synthesis, Gradual Typing, Solver-Aided Programming, Racket

Arcana Compilers Group, Northwestern University — Evanston, IL; Apr - Jun 2022
Implemented a compiler transformation that lowers object abstractions and performs stack vs. heap allocation analysis as part of the MemOIR compiler, which provides an intermediate representation for objects to enable specialized transformations like dead field elimination.
→ Compilers, LLVM, C++

Work Experience

PLUM Lab, University of Maryland College Park, MD; Aug 2024 - Present
Graduate Research Assistant
Working with David Van Horn and Leonidas Lampropoulos in the intersection of property based testing, compilers, and contracts.

Epic Systems Verona, WI; 2022 - 2024
Software Developer in Population Health Analytics

- Drove multi-year strategic direction of an analytics framework via client feedback and collaboration with other analytics teams.
- Built population health data models and visualizations within Microsoft SQL EDW in collaboration with multiple teams.
- Designed internal processes and utilities to improve best practices, development, testing completeness, and coordination with other teams.

→ Database Management, Data Models, Analytics, SQL, C#, TypeScript, Dashboard Design

Change Healthcare Remote; June - Sep 2020
Data Engineering Intern
Developed serverless components based on AWS Lambda functions and Glue ETL to be used in production data pipelines.
→ AWS Lamba, Glue, Scala

Talks

- Compiler Testing with Sized Types NJPLS December 2025

Awards & Honors

- 2023 CSGrad4US Fellow (NSF-sponsored fellowship similar to the GRFP)

Service & Teaching

- Teaching assistant for Design and Implementation of Programming Languages, Organization of Programming Languages (OCaml, Rust, Racket).
- Student volunteer at POPL 2025.
- Mentoring new developers at Epic Systems.