

Education

M.S. in Computer Science, Georgia Institute of Technology, Atlanta, GA August 2022 - May 2023
B.S. in Computer Science, Georgia Institute of Technology, Atlanta, GA August 2018 - May 2022

Research Experience

Collaborator with *Daan Leijen (Microsoft Research Redmond)* July 2022 - present
Replacing OCaml's garbage collector with the Perceus reference counting system to enable Koka's FBIP-style programming via drop and reuse specialization in OCaml.

Independent project, TINKER Lab August 2022 - present
Developing Neko, a quantum map-filter-reduce programming language that leverages superposition and interference for large-scale data processing. Submitted a proposal for funding through NSF GRFP.

Collaborator, SAIL lab with *Alexey Tumanov* August 2022 - present
Prototyping Mudos, a novel device-driver model that gives the kernel more control over the virtualization and scheduling of compute devices like GPUs, TPUs, and custom accelerators.

Graduate Research Assistant, Habanero Lab advised by *Vivek Sarkar* August 2022 - present
Extending the AutoMPHC project to handle intra-node automatic parallelization of Python programs using OpenMP/CUDA.

Undergraduate Research Assistant, TINKER Lab advised by *Tom Conte* August 2020 - May 2022
Wrote a space-efficient implementation of the Quantum Verification of Matrix Products algorithm and benchmarked it. Secured third place (Explore category) in Georgia Tech's UROP symposium.

Select publications

- [1] Elton Pinto. "Neko: A quantum map-filter-reduce programming language". In: *Student Research Competition (SRC). Proceedings of the 50th ACM SIGPLAN-SIGACT Symposium on Principles of Programming Languages*. POPL '23.
- [2] Elton Pinto, Jeffrey Young, Thomas Conte, Austin Adams, and Eugene Dumitrescu. "An Implementation of the Quantum Verification of Matrix Products Algorithm". In: *4th International Workshop on Quantum Resource Estimation, QRE 2022. Proceedings of the 49th Annual International Symposium on Computer Architecture*. ISCA '22.

Work Experience

Software Engineering Intern, Meta, Privacy Language Experience (PLeX) team May 2022 - August 2022

- Developed a distributed callgraph artifact generation system that feeds into a Hack typed-AST static analyzer for detecting privacy-centric data leaks through global variables
- Built a pipeline for incrementally ingesting over 100M records of dynamic Hack callgraph data into stacked Glean databases
- Optimized Glean query using derived predicates, resulted in 280x speedup
- Incrementally ported system from Python to Rust employing data-level parallelism, resulted in 4.5x speedup

Software Engineering Intern, Meta, PyTorch Dev Infra team May 2021 - August 2021

- Setup infrastructure to build, test, and deploy a fork of clang-tidy in PyTorch CI using Docker and GitHub Actions
- Added support for the `max-tokens` pragma in clang-tidy which alerts users when the number of tokens exceeds a limit
- Authored a clang-tidy check that detects infinite loops caused by integer/floating-point overflow

Skills

Languages: OCaml, Rust, Python, JavaScript, C, Haskell, Coq, Java, assembly

Technologies: git, shell, Docker, kernel modules, web components, posits

Research Interests: FBIP, memory management, effect handlers, high-level abstractions for quantum computing