# Elton Pinto

epinto6@gatech.edu | eltonpinto.me

## 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* — July 2022 - present
Replacing OCaml's garbage collector with the Perceus reference counting system to enable Koka'a 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. Pending submission to POPL'23 SRC.

**Collaborator, SAIL lab** *with Alexey Tumanov* — August 2022 - present
Prototyping Mudos, an OS structure for making the kernel more aware of other compute devices (like GPUs, TPUs, and post-Moore systems) and provide abstractions like virtualization, multi-tenancy, and scheduling for these devices.

**Graduate Research Assistant, Habanero Lab** *advised by Vivek Sarkar* — August 2022 - present
Automatically parallelizing Python programs to run on single-node systems using OpenMP, the ATL language, and the egg rewrite system.

**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.

## Publications

[1] 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. 2022.

[2] Austin Adams, Elton Pinto, Jeffrey Young, Creston Herold, Alex McCaskey, Eugene Dumitrescu, and Thomas M. Conte. "Enabling a Programming Environment for an Experimental Ion Trap Quantum Testbed". In: *2021 International Conference on Rebooting Computing (ICRC)*. 2021.

## 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