Bradley J. McGhee

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Education

Georgia Institute of Technology May 2027

B.S. Mathematics, Minors in Economics and in Quantum Technology *Atlanta, GA*

Coursework: algorithms, probability theory, abstract algebra, quantum mechanics, combinatorics, number theory

GPA: 3.76

Experience

Quantitative Research Intern May 2026 – August 2026

Intercontinental Exchange Holdings, Inc. *Sandy Springs, GA*

- Researched, developed and tested new risk pricing techniques using real-world market data.
- Used vanilla options markets to derive pricing for new economic indicator derivatives contracts.
- Implemented new strategies in C++ within Intercontinental Exchange's clearinghouse risk model, IRM2.

Research Assistant, Quantum Computing/Compiler Design August 2024 – December 2025

Georgia Institute of Technology, Center for Research into Novel Computing Hierarchies *Atlanta, GA*

- Worked with the quantum signal processing (QSP) and quantum singular value transform (QSVT) frameworks.
- Created new syntax for QSP, enabling the creation of important algorithms in a high-level language.
- Developed a compiler for the new syntax with Python and Qiskit, bringing these algorithms to researchers.
- Presented a poster on generating QSP circuits from arbitrary functions at the 2025 CRNCH Summit.

Research Intern, Elementary Particle Physics June 2023 – December 2023

Kennesaw State University, Theoretical Particle Physics Group *Kennesaw, GA*

- Made quantitative predictions for a hadron collider experiment using a model of an undiscovered Z' particle.
- Developed a tool for physicists to compute reaction cross-sections for Z' production in C++.
- Composed and presented a 40-page manuscript detailing my process and phenomenological results.

Projects

Deep Learning Network | *C* github.com/nptnl/babys-first

- Created a deep learning model from scratch with no libraries to classify images.
- Implemented backpropagation, nonlinearization, and mini-batch gradient descent to train the model.
- Used quantization to run the network using small (8-bit) datatypes for training speedups.

Math Functions Library | *Rust* github.com/nptnl/basemath

- Created a math functions library in Rust with zero dependencies.
- Used generic types to allow several datatypes in the same math functions.
- Implemented exponentiation, trigonometric functions, and arbitrary polynomials of generic-typed coefficients.
- Reached 7,000+ total downloads Rust's package distributor.

General Fractal Generator | *Rust* github.com/nptnl/generic-fractals

- Created input and parameter space fractal generators for recursive functions on complex numbers.
- Used multi-threading in Rust for parallel image generation, with a 5x speedup.
- Created a custom image format to easily write and store plots 2x smaller than similar formats.
- Generated plots based on arbitrary functions, producing both well-known and novel sights.

Honors & Awards

- President's Undergraduate Research Award (x2), a competitive Georgia Tech salary award for lab research.
- Eagle Scout Rank Award
- National Merit Scholarship Finalist

Skills & Interests

Languages and Tools: Python, C/C++, Rust, Qiskit, HTML/CSS, Git, bash/zsh, SQL
Technical Skills: algorithms analysis, probability and statistics, quantum computing, financial derivatives
Hobbies: Swimming, reading, jazz, pickleball, lifting, Brazilian jiu-jitsu