

EDUCATION

- **Georgia Institute of Technology** Atlanta, GA
Bachelor of Science in Computer Science; GPA: 3.48 Aug. 2017 – May 2020

EXPERIENCE

- **Georgia Tech Research Institute** Atlanta, GA
ICL Research Assistant and CIPHER Hardware Security Intern Nov 2018 – Current
 - **CIPHER - Hardware Security Intern:** Constructing a heterogeneous multi-chip emulator; developing an application built to help analysts understand and manipulate hardware designs.
 - **CIPHER - JIT Compiler Benchmarking:** Created a JIT benchmarking suite that utilizes several handwritten LLVM and Cranelift programs to show their performance differences.
 - **CIPHER - Open Source Contributing:** Added a patch to the Cranelift JIT compiler to prevent unauthorized memory accesses in security-enhanced Linux distributions using anonymous memory maps.
 - **ICL - Research Assistant:** Examining the capabilities of new RTX ray-tracing technology against the current state-of-the-art in the context of radio frequency signals in urban areas; created a pipeline for creating sample data and an OpenGL visualizer for CPU-based rendering, assisted in the development of a NVIDIA OptiX raytracer.
- **Georgia Institute of Technology** Atlanta, GA
PACE HPC Intern and ACL Research Assistant May 2018 – Nov 2018
 - **PACE - Lead Student Assistant:** Managed a team of student assistants in maintaining and building software for the computing cluster.
 - **PACE - Automation Scripting:** Developed bash scripts to automate building specific package configurations and to sync against remote repositories.
 - **ACL - Research Assistant:** Created an automated benchmarking suite for several types of neural networks against popular datasets.
 - **ACL - BitFusion:** Co-authored the BitFusion ISA paper (ISCA 2018) describing a dynamically composable architecture for neural network acceleration.
 - **Smart City Infrastructure:** Identified vehicles using background subtraction and feature detection techniques to analyze driver behavior near high density traffic and safety devices.
 - **Automated Algorithm Design:** Maintained the caching feature of the genetic programming engine EMAD; developed a documentation standard and several bug fixes.
- **University of Georgia Small Satellite Lab** Athens, GA
Algorithm Developer and Student Researcher Summer 2017
 - **Algorithm Developer:** Assembled a prototype structure from motion pipeline for 3D reconstruction processing on a CubeSat embedded system.
 - **Student Researcher:** Wrote a trade study on the practicality of structure from motion libraries for use on a CubeSat regarding computational complexity and design.

PROJECTS

- **CHIP8 Emulator:** Open source CHIP8 emulator created in Rust as an introductory hardware project.
- **EsoInterpreters:** Implementations of esoteric compilers written in Rust with custom JIT compilation.
- **rsh and cpp-sh:** Open source Linux shell with background/foreground process management, job control, and text parsing.
- **SimpleNets:** A repository of neural network structures written in Python; implemented an RNN that samples text from Don Quixote.
- **Verilog Processor:** A pipelined processor with programmable interrupt handlers written in Verilog for an Altera DE-0 FPGA.