




Brooke Dolny

Software Engineer

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Languages and Technologies

C++ · C · Java · Python · C# · Bash · MATLAB · Git · UNIX · Makefile · Qt · L^AT_EX

Experience

Undergraduate Research Assistant · Institute for Quantum Computing Jan 2021—Apr 2021

- Designed and implemented a Python library for transferring images via GPU Direct.
- Utilized image processing techniques to identify the location of atoms in an image.
- Implemented software libraries to perform image acquisition from an EMCCD Camera.
- Developed a model to generate images of atoms in optical traps.

Software Developer Intern · NVIDIA May 2020—Aug 2020

- Contributed to the NVIDIA Omniverse Platform's C++ audio processing library.
- Replaced unnecessary busy waiting with semaphores in the audio processing engine.
- Identified and removed concurrency bugs in the codebase.
- Resolved synchronization issues between Python and C++ audio libraries.

Software Development Student (Core OS) · BlackBerry Sept 2019—Dec 2019

- Developed security solutions for vehicles by integrating Cylance technologies into QNX.
- Designed and implemented a consumer–producer system in C++ for processing vehicle messages efficiently.
- Implemented a state machine in C# for identifying a driver based on vehicle data.

Secure Software Developer · ECRYPT Jan 2019—Apr 2019

- Developed secure vehicle to vehicle communication with C++.
- Implemented a parallelized manager for validating the format of messages.
- Identified and resolved race conditions throughout the codebase.

C++/Backend Developer · DF/Net Software May 2018—Aug 2018

- Fixed bug in hashing function allowing over 8000 users to login after weeks of lockout.
- Designed an API endpoint that resulted in up to 4.5x faster page load times for a web app.
- Created a report on security flaws and vulnerabilities in C, C++, and Javascript codebases.

Projects

Personal Cryptographic Library · C Apr 2019

- Developed a working implementation of the AES with CBC and ECB operational modes, and the SHA2 suite of cryptographic hashes.

Fractal Generator · Java Apr 2018

- A fractal art generating program that supports the Mandelbrot and Julia sets.
- Leverages parallel programming to improve performance by using a worker pool.

Education

Candidate for Bachelor of Software Engineering · University of Waterloo 2022

- Class academic representative for 3B and 4A terms.

Interests

Ice Hockey, Classical Music, Audio and Photo Restoration, Math