Brooke Dolny

Software Engineer

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Languages and Technologies

C++ · C · Java · Python · CUDA · C# · Rust · Bash · MATLAB · Git · UNIX · Makefile · LaTeX

Experience

Software Developer Intern · Autodesk Research — *May 2022 – Dec 2022 · Sept 2021 – Dec 2021*

- Contributed to Autodesk Research's Neon Project for multi-GPU grid-based computations.
- Implemented 2D and 3D GPU-accelerated Lattice-Boltzmann fluid simulations using Neon.
- Generated animations of 2D and 3D lid-driven cavity flow and a 2D Kármán vortex street.
- Implemented a mesh-based finite element solver for linear elasticity.

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

- Designed and implemented a Python library for transferring images via GPU Direct.
- Leveraged image processing techniques to identify the location of atoms in an image.
- Implemented Python 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 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.
- Wrote an asynchronous interface for receiving messages from a gRPC stream.

Secure Software Developer · ESCRYPT — *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.

Projects

Staggered Grid Linear Elasticity Solver · C++ — *Feb 2023*

- Implemented a finite-difference solver for the linear elasticity equations on a staggered grid

Education

Candidate for Master's of Mathematics · University of Waterloo — *2024*

- Supervised by Prof. Christopher Batty

Bachelor of Software Engineering · University of Waterloo — *2022*

- Graduated with Distinction
- Class academic representative for 3B, 4A, and 4B terms.

Interests

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