# Brooke Dolny
Software Engineer

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## Languages and Technologies

C++ · C · Java · C# · Python · Bash · Git · UNIX · Makefile · Qt · LaTeX

## Experience

### 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.
- 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.
- Modernized C++98 codebase to C++14.
- Ran retrospective meetings as part of the team's agile process.

### 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; introduced better C programming practices as a result.
- Designed an API endpoint that resulted in up to 4.5x faster page load times for a web application.
- Created a report on security flaws and vulnerabilities in C, C++, and Javascript codebases.

## Projects

### Personal Cryptographic Library                    *Apr 2019*

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

### Fractal Generator                    *Apr 2018*

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

### Traffic Simulator (Traffix)                    *Nov 2017*

- Simulates traffic flow in an arbitrary city defined by a graph.
- A graphical interface presents to the user a real-time view of congestion and traffic patterns.
- The application was written in C++ with the Qt framework.

## Education

### Candidate for Bachelor of Software Engineering · University of Waterloo                    *2022*

- President's Scholarship with Distinction

## Interests

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