

# Raymond Chang

✉ [rkchang@uwaterloo.ca](mailto:rkchang@uwaterloo.ca)  [github.com/rkchang](https://github.com/rkchang)  [linkedin.com/in/rkhchang](https://linkedin.com/in/rkhchang)  
 [raymondchang.ca](https://raymondchang.ca)

## Skills

---

- Proficient: Python, C++, C, Java, SQL, TypeScript
- Technologies: Git, SQLite, GNU Make, Spring, CMake, PostgreSQL, Flask
- Selected course work: Design & Analysis of Algorithms, Performance Engineering, Information Retrieval, Compiler Construction, Operating Systems, Databases, Artificial Intelligence, Language Design and Implementation

## Education

---

### University of Waterloo

09/2022 to Now

Masters of Mathematics in Computer Science (Thesis) (94.67%)

### University of Ottawa

09/2016 to 04/2021

Honours Bachelor of Science in Computer Science (CO-OP) (8.35/10)

Deans Honours List

Honours project - Modelling and verifying distributed leader election algorithms with TLA+.

## Work Experience

---

### CoreOS Software Development Student

Ottawa, Canada — 06/2020 to 08/2020

Blackberry QNX

- Developed a program in Python to detect illegal instructions in the kernel binary by using binary analysis tools
- Wrote Unit tests in C for the QNX Neutrino kernel and hypervisor
- Used Git and GNU Make

### CoreOS Software Development Student

Ottawa, Canada — 09/2019 to 12/2019

Blackberry QNX

- Worked on a Python program to test and track new commits to Review Board
- Setup a QNX Hypervisor System with an Ubuntu guest to demonstrate its abilities to other teams
- Wrote Unit tests in C for the QNX Neutrino kernel and hypervisor
- Used Git and GNU Make

### Telematics Control Unit Software Developer

Ottawa, Canada — 01/2019 to 04/2019

Ford Motor Company

- Developed features and Unit tests for C and C++ multi-threaded Linux applications
- Fixed bugs and multithreading related issues found by code analysis tools such as Thread Sanitizer and Clang Static Analyzer
- Used GNU Make, Git, Jenkins and the Google repo tool

### Junior Programmer

Ottawa, Canada — 05/2018 to 08/2018

Canadian Border Services Agency

- Worked in a team of three to create a web application for the management of software development using Java, JSP, Hibernate, jQuery, SQL and Spring MVC
- Developed functional UI Mock-ups for the web application using HTML, CSS and JavaScript
- Gathered requirements for the web application and participated in weekly progress meetings
- Improved Unit test coverage of a separate reporting application
- Acquired the Enhanced Reliability Status level of security clearance

## Projects

---

### Juice - Java Compiler - Course project for Compiler Construction

01/2023 to 04/2023

- Developed a Java compiler targeting x86 with two teammates
- Consisted of 28753 lines of TypeScript, 628 Jest unit tests and passed the majority of course provided test cases
- Ported and upgraded an existing Intermediate Representation (IR) interpreter from Java to TypeScript to improve the debugging process
- Wrote hundreds of Jest unit tests with final code coverage of 80%
- Source code available upon request

### Lettuce - New Programming Language and LLVM based compiler

07/2023 to 08/2023

- Worked with a partner to create a new programming language and corresponding compiler using the LLVM compiler infrastructure
- Developed compiler in C++ and added an interpreter mode
- Created a new IR using MLIR
- Source code: <https://github.com/rkchang/mlidk>

### DNS Server

12/2021 to Now

- Wrote a DNS server with C++ and the ASIO networking library
- Used Bazel for the build system and dependency management
- Wrote Unit tests with GoogleTest
- Source code: <https://github.com/rkchang/rcdns>

### Document Search Engine - Course project for Information Retrieval

01/2020 to 04/2020

- Worked with a partner to create a search engine and UI for searching through a collection of course listings and news articles by using the Flask web framework
- Source code: <https://github.com/rkchang/search-engine>, Final report available upon request