

# Charles Zhang

University of Waterloo | B. Computer Science 2023  
4.0 GPA | President's Scholarship of Distinction

(613) 600-2451  
charles.y.zhang@uwaterloo.ca  
www.charleszhang.ca  
www.github.com/charlesyz

## Summary of Qualifications

---

- Professional real time embedded C / C++ development experience
- Strong front-end knowledge from industry experience and personal iOS / web projects
- Four years' experience with Python and C / C++, two iOS apps published to the Apple App Store
- **Programming:** C++, C, Python, Bash, Swift, Typescript, JavaScript, HTML, CSS, Haskell
- **Technical:** Unix, Git, Jenkins, Jira, Dev-Ops, Angular, Bootstrap, Docker, Xcode

## Work Experience

---

### Cisco Systems Canada | Software Development co-op

May 2019 – Present

- Worked with an agile team of 5 on unit tests for the next generation Cisco ASR9000 routers
  - Created 100 testcases for Layer 3 MPLS, GRE packet forwarding using the C XTF Test framework
  - Improved line coverage by 15%, branch coverage by 25% for over 50,000 lines of code
- Reduced the Jenkins test automation infrastructure instability from 15% to < 1%
  - Created a Python automated re-try system to catch and monitor inconsistent testcases
  - Implemented C shared memory cleanup, eliminating testcase pollution
- Spearheaded the migration to model-based expected value generation with automated comparison of forwarding and data-plane structures

### Ciena Networks | Software Automation co-op

July 2018 – August 2018

- Updated Ciena's Budgeting Website's frontend using Angular 6, Angular Material, and TypeScript
- Created customizable web templates with Node.js, Bootstrap front end and Jasmine unit testing
- Used CSS Flexbox to ensure responsive design across mobile and desktop platforms
- Wrote Python scripts to automate the migration of 80,000 files from the DOORS database to Jama
- Gained experience with git, dev-ops, code reviews, software documentation

## Waterloo Design Teams

---

### Watonomous | Path Planning Technical Lead

January 2019 – Present

- Contributed to a team of 100 students working to create a level 4 autonomous car using ROS C++
- Managed a team of 5 students tasked with implementing logic for occupiable objects
- Consolidated occupiable objects logic to an expandable factory method pattern architecture
- Improved costmap API efficiency by 80% using the C++ Eigen matrix library, triple shear rotation algorithm, optimized ray-tracing, and a singleton graphics cache
- Recognized for "Outstanding Achievement" winter 2019

# Charles Zhang

University of Waterloo | B. Computer Science 2023  
4.0 GPA | President's Scholarship of Distinction

(613) 600-2451  
charles.y.zhang@uwaterloo.ca  
www.charleszhang.ca  
www.github.com/charlesyz

## Projects

---

### Article Generator iOS App

July 2018 – January 2019

- Created an iOS app in Swift that generates style-mimicking text using a Recurrent Neural Network
- Used Python, Keras, Tensorflow to train the model, CoreML to integrate the model into the app
- Trained the model on Amazon Web Services using Docker Swarm
- Gained experience with web scraping, data collection, and data sanitization
- Used XML and PLIST files to store model parameters

### Tetris Neural Network

March 2018

- Developed a Neural Network from scratch that plays Tetris using a Genetic Algorithm in a week
- Built a Tetris game simulator with a standardized API to allow programmatic interaction
- Used Pygame for graphical display and NumPy for game-state representation and computation

### EzJigsaw iOS App

August 2017 – October 2017

- Built an iOS app that allows users to build customized Jigsaw games from their own images
  - Downloaded over 300 times in 6 different countries within the first month alone
- Used the SpriteKit graphics library to create the user interface
- Practiced the model-view-controller design pattern, project management, and version control

### Arduino Development

October 2016 – January 2017

- Made an autonomous maze-solving robot based on the Arduino Microcontroller
- Implemented a custom depth-first-search algorithm to map and solve a physical maze

## Education

---

### University of Waterloo – Waterloo, Ontario

Expected April 2023

- 92% Cumulative GPA, Dean's Honours List, President's Scholarship of Distinction

### Lisgar Collegiate Institute – Ottawa, Ontario

September 2014 – June 2018

- 98% GPA (Highest Lisgar Gr. 12 Average), enrolled in the gifted program