





Jonathan Chung

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Skills

Languages : C++, C, Python, Java, JavaScript, HTML5, CSS

Technologies : DirectX 12, OpenGL, JupyterLab, Git, Flask, Linux, Firebase, Redis, DynamoDB, S3



Experience

- 2019 - Present **Undergraduate Research Assistant**, *University of Waterloo* (Waterloo, ON)
Assisted Dr. Vijay Ganesh with empirical CS research in automating the Boolean Satisfiability Problem
- Co-authored the paper "On the Hierarchical Community Structure of Practical Boolean Formulas"
 - Led the design and implementation of an advanced class of SAT solvers using Extended Resolution
 - Developed tools to experiment and report on hypotheses about SAT solver performance
- 2020
May - Aug **CAD Software Architecture Intern**, *NVIDIA Corp.* (Santa Clara, CA)
Worked on features and optimizations in C++ for GPU performance analysis tools
- Profiled and analyzed tools to identify performance bottlenecks and optimization opportunities
 - Parallelized computation and file I/O operations to reduce overall program execution time by 60%
 - Modified existing tools to process and generate performance reports for a new binary data format
- 2019
Sep - Dec **Software Development Intern**, *Darkvision Technologies Inc.* (Vancouver, BC)
Worked on data visualization tools and features in C++ for an ultrasound-based 3D imaging device
- Implemented a tiled HEVC video codec to optimize GPU encoding and maximize throughput
 - Migrated a visualization tool to DirectX 12 HLSL to improve performance and maintainability
 - Created a specialized graphing tool to correlate datasets using immediate mode graphics
- 2019
Jan - Apr **Game Programmer Intern**, *Behaviour Interactive* (Montreal, QC)
Worked on backend features for multiple video games in a RESTful microservice architecture
- Restructured object collection and reward systems using JavaScript (TypeScript) with Node.js
 - Designed a rich presence system to broadcast and log player activity with Redis and DynamoDB
 - Implemented first-party microtransactions for purchasing game items using Nintendo's REST API
- 2018
May - Aug **Software Developer Intern**, *Universe Projects Inc.* (Toronto, ON)
Worked on adding features and improving infrastructure for a cross-platform video game
- Developed a configurable visual effects system and item collection infrastructure using Java
 - Implemented a system for synchronizing game objectives using Google Cloud Datastore
- 2016, 2017
Jul - Aug **Software Development Intern**, *New York Theological Education Centre* (Markham, ON)
Developed a library management application using MySQL and VBA
- Developed a library database system to manage thousands of books and hundreds of users
 - Built an application for borrowing books, identifying overdue books, and calculating fines

Education

- 2017 - 2022 **Candidate for B.ASc**, *Honours Computer Engineering*, University of Waterloo
Cumulative Average: 91.62% | Dean's Honours List (6 Terms) | First in Class Engineering Scholarship
Enrolled in the Accelerated Master's Program for M.ASc, Electrical and Computer Engineering (2023)

Projects

- Mar 2019 **InfiniteChess**, [chjon/InfiniteChess](https://github.com/chjon/InfiniteChess)  Fairy chess on an infinite board written in C++, using OpenGL
- Sep 2017 **BlockGame**, [chjon/BlockGame](https://github.com/chjon/BlockGame)  2D physics engine and block-based sandbox game written in Java