

Alireza Mohaghegh Dolatabadi

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EDUCATION

University of Waterloo

Waterloo, Ontario

Honours Computer Science with Combinatorics & Optimization Minor; GPA: 4.00/4.00

Relevant Courses: Advanced version of Object-Oriented Software Development, Data Structure, Sequential Programs, Combinatorics, Algorithm Design and Data Abstraction, Calculus and Linear Algebra

Clubs: Blockchain Club, Poker Club

SKILLS

Languages: Python, C/C++, Rust, Mojo, Java, Haskell, R, SQL, Bash, GoLang, JavaScript, TypeScript

Libraries & Frameworks: NumPy, Pandas, Flask, Django, REST API, Node.js, Next.js

Tools & Technologies: Git, Docker, Github Actions, PyTest, JUnit, Codecov, Nginx, PostgreSQL, CMake

PROJECTS

UW Course Planner | 🌐 | 📄

- Developed a course schedule management tool using **Django** and **Next.js**, inspired by the absence of a tool that allows students to plan and visualize their course schedules before committing on the official university platform.
- Leveraged **Docker** and **Nginx** for deployment, creating a scalable, secure, and efficient production environment
- Implemented a secure authentication system using **JWT**, and configured **PostgreSQL** for reliable data storage

PQTree_rs | 🌐 | 📄

- Developed a faster alternative to SageMath's PQTree using Rust with **20%** faster performance upon benchmarks

UW Course Compass | 🌐

- Tokenized a large dataset of course requirements using a **maximal munch algorithm**, ensuring data integrity
- Parsed course requirements data after tokenization using **bottom-up parsing techniques** for graph construction
- Developed an **AndOr DAG** graph to search for prerequisites, guiding students in planning their courses efficiently

Vim-inspired Code Editor | 🌐

- Designed and developed an editor inspired by **Vim** using the **C** programming language and the **Ncurses** library
- Implemented over 10 features of **Vim**, including multiple modes, shortcuts, terminal integration, and indentation

Stronghold-inspired Game | 🌐

- Developed a game inspired by Stronghold using **Java** and **JavaFx**, applying fundamental **OOP** best practices
- Used **JUnit** for unit testing and **GitHub Actions** for CI/CD to ensure code quality and automate deployment

EXPERIENCE

Undergraduate Vice President

Waterloo, Ontario

ISAW (A University of Waterloo Student Club)

December 2023 – Present

- Managed club finances and coordinated events, ensuring successful weekly and major events for **500+** participants
- Increased event attendance by **20%** by automating registration processes and streamlining communications

Mathematics Olympiad instructor

Remote

Top Olympiad High schools

July 2022 – July 2023

- Taught **65+** students advanced **Combinatorics** and **Graph Theory**, preparing them for Olympiad competitions
- Focused on fostering and refining students' **problem-solving** skills through theoretical Olympiad problems
- Mentored students to achieve gold medals in both **National and International Mathematics Olympiads**

AWARDS & ACHIEVEMENTS

Silver Medalist - National Mathematics Olympiad: Ranked **12th** out of **10,000+** participants in the National Olympiad contest that served as a qualifier for the International Mathematics Olympiad, **IMO** (September 2021).

Ranked 56th - National Entrance Exam: Achieved the rank of **56th** out of **145,000+** participants in the highly competitive National Entrance Exam, demonstrating exceptional academic prowess and dedication (September 2022).

Silver Medalist - Combinatorics Olympiad (ICO): : Competed with talented participants and esteemed mathematics olympiadists from around the world, securing a prestigious **silver medal** (June 2022).