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 versions of Object-Oriented Software Development, Data Structure, Sequential Programs, Combinatorics, Algorithm Design and Data Abstraction, Statistics and Probability*

Clubs: *Blockchain Club, Poker Club*

SKILLS

Languages: Python, C/C++, Rust, Java, Mojo, GoLang

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 tool using **Django/Next.js**, reducing planning time by **60%** for **500+** students
- Used **Docker/Nginx** for the deployment of the tool, enhancing scalability and maintaining downtime below **0.1%**
- Implemented **JWT** for authentication and configured **PostgreSQL**, ensuring secure and reliable data storage

PQTree library | 🔗

- Optimized SageMath's PQTree using **Rust** with multi-threading, increasing performance by **200%** in benchmarks
- Added new functionalities based on this paper's algorithms, enabling support for **planar graphs** in the library

UW Course Compass | 🔗

- Built a course recommendation engine in **GoLang**, improving course selection speed and efficiency for students
- Tokenized and parsed a large course dataset, ensuring data integrity and enabling course requirements analysis
- Modeled course requirements as a **graph**, enabling efficient searches and reducing student planning time by **100%**

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 | 🔗

- Created a Stronghold-inspired game in **Java/JavaFx**, improving performance and flexibility with OOP principles
- Integrated **JUnit** tests and **GitHub Actions** CI/CD, achieving **95%** test coverage and automating test execution

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
- Automated registration processes and maintained the club's website, increasing overall event attendance by **20%**

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).