

# Charles Ran

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## EDUCATION

### University of British Columbia, Canada

2024-2028

Combined Bachelors in Computer Science and Math & Master of Management Dual Degree

### Oakville Trafalgar High School, Canada

2020-2024

High School Diploma, 4.0/4.0 GPA

- Co-President of the Math, Computer Science, and Physics Clubs. AP Scholar with Distinction (12 AP exams).

## AWARDS

Bronze Medal, ICPC British Columbia

2024

International Champion (1/7000), Canadian Open Mathematics Competition

2024

National Champion (1/16805), Canadian Senior Mathematics Competition

2023

National Finalist, IYPT Physics World Cup

2023

Top Quartile, Canadian Mathematical Olympiad

2022

## EXPERIENCE

### Founder and Fullstack Web Developer

Ontario

Math et. AI Initiative

2020-Present

- Found and manage an educational STEM nonprofit organization with 20+ staff and a community of 300+ members.
- Develop and maintain the main website and organization-wide tech architecture using Svelte, Typescript, and BulmaCSS.
- Create Math, Physics, Chess contests, YouTube lessons, and written educational STEM content, gathering \$200+ in sponsorships.

### Lead Software Developer

Mississauga, ON

Canadian Innovative Community Service Alliance

2022-2023

- Lead the development of organization homepage and tech architecture using Cloudflare, Vercel, and Svelte with 1,000+ users.
- Collaborate with cross-functional teams to consolidate project logistics for charity events and large public culture festivals.

### Executive of Mathematics and Educational Coordinator

Toronto, ON

Ontario Competitive Mathematics Committee

2023-2024

- Create and quality control math problems for province-wide competitions with 10+ participating schools and 200+ contestants.
- Monitor student growth in math enrichment summer camps, grading homework and providing feedback for 10 students.

### Hydrodynamics Researcher

Toronto, ON

Canadian Young Physicists Tournament

2022-2023

- Produce novel research concerning fractal-like fluid phenomena governed by the Saffman-Taylor instability using hydrodynamics, multivariable calculus and linear algebra modelling.
- Engineer experimental models using CAD/CAM and develop image processing pipelines and algorithms using Julia and OpenCV.

### Olympiad Math Teacher Assistant and Tutor

Mississauga, ON

LinkedKey Education

2022-2023

- Write novel resources for math olympiad courses utilizing extensive expertise with LaTeX, grade student homework
- Host homework help sessions and manage a student Discord community to provide support during COVID-19

## PROJECTS

### Virtual Olympiad Platform

🔗 virtual-olympiad/voly

Massive Science Olympiad Platform, Database, APIs, and Tools

2021-Present

- Develop educational collection of hosted platforms, databases, and tools for the Science Olympiad community.
- Create professional frontends and custom APIs using SvelteKit, React, TailwindCSS, and modern design languages.
- Build dynamic web scraper and parser for math with Cheerio and optimize a web LaTeX abstraction layer based on KaTeX for storage and full-text search. Index massive PostgreSQL database featuring 10000+ competition problems.
- Host multiplayer WebSocket server using Typescript and Node.js. Integrate PKCE authentication and create complex PostgreSQL project structures with self-hosted Supabase.
- Maintain robust scalable infrastructure and automated backups using Hetzner, Coolify, and Cloudflare.

### CERXA 3D Engine

🔗 polarr/cerxa

Volumetric Raytracing Graphics Engine

2020-2022

- Develop WebGL raymarching engine from scratch, featuring Phong shading, shadows, and distance-estimated fractal support.

## SKILLS

**Spoken Languages:** English, Chinese

**Preferred Tech Stack:** Javascript/Typescript, C++, Python, SvelteKit, React, TailwindCSS, PostgreSQL, Node.js, Cloudflare

**Soft Skills:** Strong Intrapersonal Skills, Management, Logistics, Teaching, Collaboration, Problem Solving