Charles Ran

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EDUCATION

University of British Columbia, Canada   *2024-2028*
Bachelor of Computer Science & 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

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. Al 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