GUREHMAT CHAHAL

Hamilton, ON

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Education

McMaster University   Sep. 2025 – May 2029
Honours Bachelor of Applied Science, Computer Science (Co-op)   *Hamilton, ON*
- **Relevant Coursework:** Data Structures, Discrete Math, Systems Programming, Linear Algebra, Computational Thinking, Software Development.

Experience

Advancing Future Innovators (AFI)   2024 – 2025
Founder & CTO   *Ontario*
- Founded nonprofit delivering coding workshops to 30+ students per session, expanding STEM access in local schools.
- Designed and delivered structured programming curriculum covering Scratch, logic, and computational thinking.
- Managed operations, partnerships, event logistics, and volunteer coordination for recurring workshops.

Swim & Inclusion Instructor   2023 – 2025
Super Swims & City of Brampton   *Ontario*
- Led structured lessons for children and neurodivergent participants in small-group settings.
- Designed adaptive instruction plans and maintained safety for 20+ participants per session.

Projects

PantryChef – AI-Driven Recipe Engine | *React 19, TypeScript, Gemini 2.0 Flash, Zustand, Supabase, Tailwind CSS*
- Engineered a full-stack application with **Google Gemini** multimodal integration — fridge photo scanning (Vision API), recipe generation, and substitution suggestions — routed through **Supabase Edge Functions** to keep API keys server-side.
- Designed a Set-based recipe matching algorithm with **O(P+R) complexity** and confidence scoring (exact, partial, fuzzy), plus a step-by-step Cook Mode, expiry alerts, response caching, and real-time dashboard stats.
- Implemented **154 automated tests** (Vitest + RTL), strict **TypeScript**, CI/CD via **GitHub Actions**, Row-Level Security on all Postgres tables, and pre-commit hooks with ESLint + Prettier.
- Optimized performance with code splitting, lazy loading, React.memo, and runtime data fetching — reducing the largest bundle chunk by **99.8% (3,572 KB → 8 KB gzipped)**.

NASA Space Settlement Design Contest | *Grand Prize Winner (Healthy Living Design)*
- Awarded the **Grand Prize** out of 9,000+ global participants across 12 countries for a 15-page technical proposal detailing a self-sustaining space settlement orbiting Phobos.
- Designed a closed-loop aeroponic agriculture system focused on long-term oxygen and food security for 800+ inhabitants, integrating bioreactors and atmospheric controls.
- Developed an **Arduino**-based proof-of-concept for automated environmental monitoring and irrigation control logic; presented findings at the ISDC conference.

Personal Portfolio Website | *HTML, CSS (BEM), JavaScript*
- Developed a responsive portfolio site with modular CSS architecture and dark mode support.
- Deployed via GitHub Pages with continuous updates and performance optimizations.

Technical Skills

Languages: C, Python, JavaScript (ES6+), TypeScript, SQL, HTML/CSS, Haskell
Frameworks/Libraries: React 19, Zustand, Tailwind CSS, Supabase, Node.js, Vite, PostgreSQL
Tools: Git/GitHub, GitHub Actions, Vitest, ESLint, Prettier, Cursor, Linux, VS Code, Docker
Concepts: LLM Integration (Gemini), Prompt Engineering, REST APIs, CI/CD, Row-Level Security, State Management

Leadership / Extracurricular

CPSS STEM Fellowship Executive Team
External Affairs Coordinator
- Coordinated external partnerships and STEM programming events.

MillHacks Hackathon
Best UI Award
- Designed and implemented the complete front-end interface independently.

DECA
Regional Champion & Provincial Award Winner