

VAIBHAVI AGARWAL

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Canadian Citizen

EDUCATION

University of Waterloo

Waterloo, ON

Honours Mathematics (Co-op)

Sep 2025 – Apr 2030

- **Relevant Coursework:** Data Structures & Algorithms, Functional Programming, Algebra, Linear Algebra, Combinatorics, Calculus
- **Award:** University of Waterloo President's Scholarship of Distinction (2025)

EXPERIENCE

Research Assistant in Business Analytics

Apr 2026 – Present

Hamburg University of Technology (TUHH) — React, FastAPI, Electron, Python, SQLite, Selenium, Docker Hamburg, Germany

- Developed a **full-stack desktop application** (React, FastAPI, Electron) for **ConFlowGen**, an open-source PyPI/conda-forge library, enabling **non-technical researchers** to generate synthetic maritime container datasets without Python or CLI knowledge.
- Architected a **REST API** wrapping the ConFlowGen Python API, featuring **SSE-based real-time log streaming**, SQLite-backed scenario management, and **zero-dependency deployment** via a bundled Python 3.12 runtime.
- Owned quality and delivery **end-to-end**: built a **layered test suite** (Pytest, Vitest, Selenium E2E) with coverage wired into **GitLab CI**, and containerized the app into a published **multi-arch Docker image** (linux/amd64 + arm64) for one-command deployment.
- Engineered an automated **data-cleaning pipeline** that parsed nested JSON and standardized mixed-format timestamps across a **5,000-record** dataset of inland waterway notices spanning **4 countries**, producing a validated **4,743-row** export.
- Built a **geospatial pipeline** (GeoPandas, Shapely, OSM/Overpass) that buffers the Rhine centerline (**281 sections**, ~1,973 km) into a corridor polygon for **spatial-filtering AIS vessel data**, with resilient multi-mirror fetching.

Undergraduate Reading Program Participant

May 2026 – Present

Combinatorics & Optimization, University of Waterloo (WIM DRP)

Waterloo, ON

- Selected for the **competitive Women in Mathematics Directed Reading Program** to study computational origami under faculty mentorship, analyzing flat-foldability, crease-pattern validity, and graph-theoretic models of fold sequences through combinatorics and algorithm design.

PROJECTS

empowHER | Next.js, React, TypeScript, Python, FastAPI, IBM watsonx.ai | IBM Runner-Up, GenAI '26 | Devpost 2026

- Built a **full-stack AI healthcare platform** delivering visit transcription and automated care-plan generation, with backend pipelines converting unstructured medical audio into **structured JSON** via **IBM watsonx.ai** LLMs.
- Designed an interactive **React dashboard** tracking care-readiness scores, symptom trends, and patient-coordination workflows.

AI Settlement Assistant Platform | React, Firebase, Google Maps API, Gemini AI | Devpost

2026

- Built a **profile-driven platform** personalizing newcomer guidance across housing, employment, and services, using **Firebase Firestore** and the Google Maps API for location-based discovery.
- Integrated a **Gemini AI** multilingual chatbot delivering context-aware, profile-scoped responses across **20+ languages**.

LEADERSHIP & ACTIVITIES

Editor-in-Chief

Sep 2024 – Jul 2025

Humberside Collegiate Institute

Toronto, ON

- Directed **10 subteams** of **30+ contributors** to design, produce, and deliver the annual yearbook to a student body of **2,000+**; coordinated across clubs, student council, faculty, and administration and contributed original event photography.

Assistant Badminton Coach

Sep 2022 – Jul 2025

Etobicoke Junior Badminton Club

Toronto, ON

- Coached **30+ youth players** over 3 years and managed a team of volunteers, tracking their schedules and service hours while developing players' technique through structured drills and individualized feedback.

SKILLS & INTERESTS

Languages: Python, Java, TypeScript, JavaScript, C, SQL

Frameworks/Libraries: React, Next.js, FastAPI, Flask, Express, Electron, Pandas, GeoPandas, Shapely, Matplotlib

Tools & Testing: SQLite, Firebase, Git, Docker, REST APIs, SSE, OSM/Overpass, IBM watsonx.ai, Gemini AI, Selenium, Pytest

Interests: Poker, Badminton, Photography, Painting and Hiking [check my website to see!]