# AAYUSH PANDA

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## TECHNICAL SKILLS

**Programming Languages:** C++, C, Python, Java, TypeScript, SQL, Haskell, Scheme, Bash
**Frameworks:** Flutter, Flask, Next.js, Firebase, Google Cloud, Android Development
**Data Science:** Pandas, SKlearn, Torch, MatPlotLib, NumPy

## EDUCATION

**University of Waterloo** **GPA:** 3.92/4.00
*Bachelor of Computer Science, Honours Co-op* *Sep. 2024 – Apr. 2029*

## EXPERIENCE

**Software Engineering Intern** Mar. 2025 – Apr. 2025
*Toma (YC W25)*
- Developed a server log viewer with IDE-like features to improve debugging efficiency.
- Used **BeautifulSoup** to scrape all ($\sim$ **20k**) US car dealerships, and wrote a service that periodically calls each with an AI voice to evaluate caller experience when trying to book appointments
- Enhanced logic for determining Toma's own call metrics, improving data accuracy and removing some logical errors.
- Implemented debugging APIs to facilitate analysis of content in **AWS S3** buckets directly in Metabase dashboard

**Founder and Co-President** Dec. 2021 – Jul. 2024
*hack::peel*
- Founded and led, an annual Peel-region hackathon attracting **100+ high school participants** each year
- Secured over **$20,000+** in sponsorships annually, enabling high-value prizes and industry support
- Directed a team of 25 across 7 subteams to coordinate logistics, outreach, sponsorships, and event programming

## PROJECTS

**Semantify** — *Python, React, FastAPI, Sentence Transformers, UMAP, Ollama*
- Built a document organization system that semantically clusters **1000+ files** into a directory structure in minutes using embedding models and custom hierarchical clustering algorithms
- Developed an interactive graph visualization of document embeddings to allow intuitive semantic exploration
- Implemented a RAG-powered chat interface to intelligently query uploaded documents with source citation
- Reduced processing time by $\sim$ **66%** through efficient batching and async processing
- Reduced organised directory depth by an exponential factor using a tree merging algorithm

**Phased Array SONAR** — *C++, Python, Xtensa LX6 microprocessor, AVR RISC processors*
- Engineered a sub-degree precision beam-steering phased SONAR array with real-time radar-style display on oscilloscopes.
- Designed a waveguide to reduce inter-element pitch and suppress grating lobes, enhancing beam directivity.
- Built a phased array simulator suite to visualize beamforming, steering, and focus behaviors in 2D.

**DAO Based Crypto Token Mutual Fund** — *Smart Contracts, Axelar, 0Squid, Node.js, Next.js*
- Won **2** $1^{st}$ **place sponsor prizes** worth **$3000** for best Web3 app at Hack the North 2022 (out of **829** participants )
- Used Smart Contracts with **Axelar** for cross-chain transactions and **0Squid** for token conversion.
- Integrated Web3 backend with frontend using **Node.js** and **Next.js** .

**Woodlands App** — *Flutter, Firebase, Google Cloud Storage*
- Developed a **Flutter** app to inform students about announcements, events, and cafeteria menu.
- Integrated **Firebase** and **Google Cloud Storage** for authentication and data storage.
- Achieved **400+** regular monthly users and rank **40** on the Apple App Store's top charts.

## PATENTS

**CA 3119717:** Compliant mechanism for operating flight control surfaces of a remotely piloted aircraft.
**CA 3222437 (pending):** Device for redirection of optical beams using virtual gratings generated by stationary waves.

## AWARDS

**Jane Street Estimathon @ UWaterloo (2024):** First place
**Hack the North 2022:** Winner
**PicoCTF 2022:** 2nd place in Canada, 14th (top 0.001%) globally
**FIRST Innovation Challenge 2021:** Semifinalist