

# Akarsh Bharadwaj Gopalam

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## Education

### Imperial College London

Sept 2023 - June 2027

*Electronic and Information Engineering MEng*

- Predicted Upper Second Class Honours (2:1).

### Orleans Park School Sixth Form

Sept 2021 - August 2023

- A-levels in Mathematics (A\*), Further Mathematics (A\*), Physics (A\*).

## Professional Experience

### OncoFlow

July 2025 - Present

*Software Engineering and AI Intern*

- Built OncoFlow's early-stage healthcare AI pipeline and app using React (TypeScript) and TailwindCSS.
- Engineered an Express.js (TypeScript) notification service with Nodemailer, using connection pooling and persistent SMTP connections with a **5-minute** reuse timeout, cutting email notification latency by **42%**.
- Implemented Redis caching in Docker, reducing repeated LLM chat suggestions queries by **50%+**.
- Contributed to and tested AI prompts by creating a pipeline using Python FastAPI on an AWS EC2 instance, ensuring that the selected LLM extracted PDF information accurately and offered medical-grade AI guidance based on patient data and preexisting databases.

### British Petroleum (BP) Digital Science Sector

June 2024

*Insight*

- Attended meetings with the Digital Science team, exploring topics such as embodied AI and deep learning.
- Designed a WeBots C++ project using an e-puck, utilizing its **8 distance sensors**, ensuring no collisions.
- Presented my WeBots project via PowerPoint to the principal of Digital Science, receiving positive feedback.

## Personal Projects

### SharpeOpt: A finance app | Next.js, Express.js, Python, MongoDB, TailwindCSS

[GitHub](#) [Live App](#)

- Built a polyglot finance app with a Next.js (TypeScript) + TailwindCSS frontend (deployed via Vercel), an Express.js (TypeScript) backend (deployed via Render) and a FastAPI microservice (deployed via Render) for SciPy-based financial computations and yfinance/Marketax APIs.
- Engineered a Sharpe Ratio optimizer with user-defined weight constraints, returning the portfolio's optimal weight allocations and key metrics such as annualized Sharpe Ratio, annual return and annual risk.
- Created a Chart.js Historical Data view for opening/closing price comparison between **2 stocks**.
- Integrated Marketax API for real-time financial news, applying **20 minute** TTL caching in the Express.js backend to reduce API calls and cut latency by **93%**.
- Implemented JWT authentication with bcrypt hashing, MongoDB persistence and protected routes for secure session management and access control.

### Travel App | React, Python, MongoDB, PostgreSQL, TailwindCSS

[GitHub](#)

- Developed a multi-page travel app with a React (TypeScript) + TailwindCSS frontend and a FastAPI backend, using PostgreSQL for destination storage.
- Implemented NLP-based destination matching with sentence transformers to semantically analyze queries and return top **3 matches** from **200+** destinations via vector similarity, further allowing for wishlist saving.
- Integrated support for displaying destination data for climate and average temperature.
- Incorporated OpenStreetMap API with search functionality, persistent user destination history and dynamic map rendering of queried and stored locations.
- Created per-destination journals to document experiences, implementing caching that reduced MongoDB query load by **50%** and decreased data access times from  $\approx 38\text{ ms}$  to  $\approx 0.002\text{ ms}$  (**19,000x** improvement).

## Technical Skills

- **Languages:** C++, Java, Python, JavaScript/TypeScript, HTML/CSS, Tailwind CSS, SQL.
- **Frameworks/Libraries:** React, Next.js, Express.js, FastAPI, NumPy, Pandas, Spring Boot.
- **Tools & Technologies:** Git, Github, VS Code, MongoDB, PostgreSQL, AWS EC2, Postman.