Ayush Sharma

Indian Institute of Technology, Goa

3rd Year **Undergraduate**, **Mathematics and Computing**
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Education

B.Tech, Mathematics and Computing, IIT Goa,	2023 – Present

Experience

Software Development Intern [Supervisor:- Dr. Rahul CS]　　　　　　　　　　　　**May 2025 – July 2025**

- **Role:** Backend developer for ERP modules (consultation, referral, evaluation).
- **Tasks:** Designed and integrated RESTful APIs using Express.js and MongoDB, refactored backend logic for form submissions, student updates, and admin approval workflows. Collaborated with frontend team to ensure smooth integration.
- **Accomplishments:** Optimized database queries and API response handling, reducing average fetch times by **25%**. Enhanced data consistency through validation and middleware checks, lowering bug frequency in record updates.

Projects

Task Queue System [GitHub]　　　　　　　　　　　　　　　　　　　　　　　　　　**Dec 2025**

- **Situation/Task:** Required an asynchronous backend system for reliable background job execution with retries and duplicate prevention.
- **Action:** Built a Redis-backed task queue with REST-based ingestion, PostgreSQL, stateless workers, idempotent execution, exponential backoff retries, and recovery of stalled tasks via periodic re-queuing.
- **Accomplishments:** Reduced task polling latency by **~95%** (4.5ms→0.2ms), achieved **~4ms API latency**, sustained **40k+ enqueues/sec**, and prevented duplicate execution via strict idempotency and non-retryable error handling along with architecture designed for horizontal scaling via multiple worker instances.
- **Tech Stack:** Node.js, Express.js, PostgreSQL, Redis

Alumni Management System [GitHub] [Demo]　　　　　　　　　　　　　　　**March 2025 – Apr 2025**

- **Situation/Task:** Students lacked centralized visibility into placement statistics and alumni career paths, making data-driven academic and career decisions difficult.
- **Action:** Built a MERN stack platform with JWT authentication, role-based access control, and admin-verified profile update workflows. Implemented server-side filtering for placement and alumni data.
- **Accomplishments:** Optimized placement search queries using compound indexing and field projection, reducing documents scanned by **96%** (10k → 360) and improving query latency by **50%**, measured via MongoDB executionStats on a 10k-record dataset.
- **Tech Stack:** React.js, Node.js, Express.js, MongoDB, JWT

Fraud Detection System [GitHub] [Demo]　　　　　　　　　　　　　　　　　　　　**Oct 2024**

- **Situation/Task:** Goa Police Hackathon required a system to detect and flag fraudulent websites in real time.
- **Action:** Designed a multi-signal fraud detection pipeline combining SSL certificate validation, domain age analysis, phishing keyword detection, and external AI-based scoring. Ordered checks to prioritize low-cost signals before invoking expensive API-based analysis.
- **Accomplishments:** Reached **85%+ fraud detection accuracy** in testing datasets. Project ranked in top 32 out of 100+ hackathon teams.
- **Tech Stack:** Python, Flask, MongoDB, Gemini API, Beautiful Soup

Skills

Programming Languages: C++, Python, JavaScript
Backend Technologies: Node.js, Express.js, PostgreSQL, Redis, REST APIs, MongoDB
Frontend Technologies: React.js, HTML, CSS, JavaScript
Tools & Infrastructure: Git, Linux, Docker (learning), Postman, JWT
Coursework: Algorithm Design, Data Structures, Software Tools, OS Internals, Compilers, Cache Design

Achievements & Extracurricular

- Secured top 32 position among 100+ teams at Goa Police Hackathon 2024 with a Fraud Detection System achieving 85%+ accuracy.
- Achieved LeetCode rating of 1800+ (top 8% globally), demonstrating problem-solving and DSA proficiency.
- Selected for Inter-IIT Basketball Championship, representing IIT Goa.