Sagnik Pal

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Education

University of Massachusetts Amherst Expected Graduation: May 2026
Major: Computer Science (BS) | Minor: Physics | Honors College GPA: 3.812/4.000

Distinctions: Chancellor's Award Scholarship ($16,000 annually), Dean's List Honors (all semesters)
Coursework: DSA, Architecture (x86 & ARM), Operating Systems, Networks, AI & ML, Quantum Information
Activities: FreshCICS, CICSoft CareerDev, ACM Cybersec and ML, Robotics Club, Quantum Computing Club

Experience

CICS ACQuIRe **Research Assistant** **Sep 2023 - present**

- Developed qWalkBuilder, a Python library that streamlines the setup of customizable quantum walks
- Explored diverse quantum walk features and mathematical properties through advanced benchmarking analyses in QISKit, utilizing eigenbasis entropy methods to assess performance across simulators and real hardware.
- Building a high-performance simulator for multiplexed two-way quantum networking protocols using QuantumSavory.jl, leveraging GPU-accelerated matrix computations for cutting-edge quantum communication research.

AmherstTech **Full-Stack Developer** **Jun 2024 - Aug 2024**

- Lead developer in an emerging homegrown startup providing cutting-edge IT services to local businesses.
- Architected backend services, including API chains using ExpressJS and Django, websockets, and distributed microservices architecture in Docker and designed optimized relational database schemas in PostgreSQL
- Developed frontend components in Flutter, writing precise API calls for seamless UI integration and data handling.
- Implemented Agile workflows in Jira and Jenkins for CI/CD to enhance project efficiency and reliability

NIC India **Backend Developer** **Dec 2023 - Jan 2024**

- Created a Java Spring Boot service to read, process, and store real-time medical data from MQTT streams, enhancing scalability and reliability of medical data acquisition, and pre-process data to make diagnosis easier.
- Integrated HL7 FHIR models into backend workflows, achieving a standardized approach for patient data.
- Built RESTful endpoints to support HTTP requests for secure and efficient data access, improving tech accessibility

Projects

SpotVision: Parking Spot Detector (devpost.com/software/spotvision) **November 2023**

Cloud-based hardware hack that helps users find the nearest free parking spot.

- Engineered a Raspberry Pi setup, developing Python scripts to capture and upload video feeds to Google Cloud.
- Architected and implemented backend functionalities on Google Cloud, seamlessly routing video feeds to an object recognition endpoint. Developed code for distributing output video feeds to multiple clients.
- Crafted a user-friendly frontend client that efficiently receives and displays the processed video output.

Gymbel: Find your Gym Buddy (devpost.com/software/gymble) **February 2024**

Cross-platform flutter app that matches gym-goers. Winner at Hack(H)er413 2024

- Implemented token-based authentication with secure credential storage, enabling persistent logins
- Developed an ExpressJS backend on DigitalOcean for robust client-server communication, efficient data processing, and MongoDB-based persistent data storage; authored API calls for frontend integration in Flutter/Dart

Skills

Programming Languages: C, C++, C#, Java, Python, Julia, Visual Basic, HTML/CSS, JavaScript, Dart
Technologies: MongoDB, PostgreSQL, ExpressJS, ReactJS, ReactNative, Vue, QISKit, Flutter, Django, Spring
Tools & Platforms: Linux, Git/GitHub, GCloud, Arduino, Raspberry Pi, Kafka, MQTT, Docker, Powershell