Arnab Bhowmik

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Education

Stony Brook University **May 2027**

Bachelor of Science with Honors in Computer Science *GPA: 3.83*

Relevant Coursework: Software Development, Software Engineering, Theory of Computation: Honors, Analysis of Algorithms: Honors, Data Structures, Object-Oriented Programming, Systems Fundamentals, Programming Abstractions, Linear Algebra

Experience

Compute Platform Engineering Intern **May 2025 – Aug. 2025**

GlaxoSmithKline plc *Seattle, WA*

- Developed an interactive **Python CLI** that uses workload diagnosis to auto-select optimal HPC environments across **Slurm and Google Batch** and optimize resource specifications when applicable, with two submission modes (automatic job script generation/submission and direct environment access), **reducing compute costs by ∼10%**.
- Containerized and deployed the CLI using both **Docker and Apptainer** for cross-platform compatibility on Windows, Linux, and Unix systems, with planned rollout to **3,000+** computational scientists company-wide.
- Built proof of concept demonstrating architectural optimizations for AI/ML team's prototype agentic system's tool orchestration layer, achieving **∼35% reduction in context usage**.

Teaching Assistant **Jan. 2025 – Dec. 2025**

Stony Brook University *Stony Brook, NY*

- Led recitations, review sessions, and office hours for **250+** students across Programming Abstractions (CSE 216) and Software Development (CSE 316).
- Helped revise course materials, graded assignments/exams, and proctored exams to ensure smooth course operations.

Student Software Developer **Sep. 2024 – Present**

Stony Brook University Vertically Integrated Projects (VIP) Program *Stony Brook, NY*

- Led the HealthByte subteam and its development, delegating tasks, creating onboarding resources, and organizing meetings.
- Developed prototype patient-facing **iOS** and clinician-facing **full-stack web** applications for monitoring post-surgery recovery using Apple Health data and custom forms, with a centralized database and authentication across both platforms.
- Develop **Regio Vinco**, an interactive web-based geography educational game helping elementary and middle school students better understand world geography, iterating on versions tested with **150+** students at partnering schools.

Full Stack Developer **Jul. 2024 – May 2025**

QuattronKids *Remote*

- Led full-stack development of **PenguinLearn**, a **RESTful educational platform**, using Next.js, React, Supabase, and Prisma ORM, enabling migration from third-party hosting and **reducing overall operational costs by ∼20%**.
- Implemented an on-site **real-time messaging system** for direct communication between parents and teachers, integrated **Stripe payment processing**, and automated class meeting scheduling via the **Zoom API**.
- Built test suites with **Jest and Playwright** and set up a **CI/CD pipeline**, ensuring reliability and streamlined deployments.

Projects

TA Tools | *Python, Flask, Beautiful Soup, Selenium WebDriver, SQLite, JavaScript* **Jul. 2024 – Aug. 2024**

- Developed a full-stack web application using Flask, Jinja, and SQLite to **automate logistics tasks** for teaching assistants at a tutoring center, improving task efficiency by approximately **200%** for active users.

NutriProof | *Python, Flask, JavaScript, OpenAI API (GPT), Wolfram Alpha API* **Mar. 2025**

- Built a Chrome extension to analyze user-selected text about health and nutrition using a GPT model fine-tuned on self-labeled data, parsing claims to generate Wolfram Alpha queries and re-integrating verified results for more accurate fact-checking.

Seawolf Accessibility | *Next.js, FastAPI, Python, C, scikit-learn, NumPy, Google Maps API* **Feb. 2025 – Present**

- Develop an interactive campus navigation web app to recommend and visualize optimal accessible routes in real time.
- Build a **custom OpenStreetMap parser in C** to extract and preprocess map data for **Dijkstra's algorithm**, mapping building entrances/exits to support indoor traversal and using **KNN** to suggest alternative routes.
- Enhance the routing cost function by **training a linear regression model** with **scikit-learn and NumPy**.

Skills

Languages: Java, Python, SQL, Bash, C, OCaml, JavaScript, PHP, Swift
Frameworks: NumPy, pandas, React, Vue, LangChain, PyTorch, scikit-learn, Next.js, Express.js, Node.js, FastAPI
Tools: PostgreSQL, MySQL, SQLite, MongoDB, Redis, Pinecone, Git, Docker, GitHub Actions, Ansible, Terraform, Jira, Google Cloud Platform (GCP), Amazon Web Services (AWS)
Concepts: RESTful APIs, Agile Development, Machine Learning, Natural Language Processing (NLP), High Performance Computing (HPC), Linux, LLMs, Model Context Protocol (MCP)