Arnab Bhowmik

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Education

Stony Brook University **Stony Brook, NY**

Bachelor of Science with Honors in Computer Science, GPA: 3.79 *Aug. 2023 – May 2027 (expected)*

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 **GCP Compute Engine and Batch** and optimize resource specifications when applicable, with two submission modes (automatic job script generation/submission and direct environment access), **reducing compute costs by ∼7%**.
- 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 consumption** while **improving performance**.

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

Stony Brook University *Stony Brook, NY*

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

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

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

- Develop a **mobile app** in Swift to help SBU clinicians monitor patients' post-surgery recovery progress by combining Apple Health data and custom forms to analyze their health via the HealthKit and ResearchKit frameworks.
- **Lead** the HealthByte subteam, creating resources for onboarding new team members, delegating tasks, and organizing meetings.
- Develop a **full-stack Next.js web application** for clinicians to interact with patient data gathered via the mobile app, with centralized authentication and database management for both applications.

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 a **real-time messaging system** within the platform for direct communication between parents and teachers.
- Built test suites with **Jest and Playwright** and set up a **CI/CD pipeline**, ensuring reliability and streamlined deployments.

Activities

Undergraduate Researcher | *OCaml, Dune* **Dec. 2024 – Present**

Stony Brook University *Stony Brook, NY*

- Investigate and develop foundational **ML/NLP tools** in OCaml to address ecosystem gaps in tokenization, text processing, and statistical text analysis.

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 previous workplace, improving task efficiency by approximately **200%** for those who used it.

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 with similar accessibility characteristics.
- Enhance the route cost function using **scikit-learn and NumPy** to perform **linear regression** on aggregated cost data based on stair penalties and slope gradients computed using Google Maps Elevation API data.

Skills

Languages/Databases: Java, Python, SQL (PostgreSQL, SQLite), MongoDB, Pinecone, Bash, C, OCaml, JavaScript, PHP, Swift
Frameworks/Runtimes: Next.js, Express.js, Node.js, FastAPI, Playwright, Flask, Tailwind CSS
Libraries: NumPy, scikit-learn, pandas, Beautiful Soup, Selenium, React, jQuery, pytest, Jest
Developer/DevOps Tools: Git, Docker, GitHub Actions, Ansible, Terraform, Jira, Slurm, Amazon Web Services (AWS), Google Cloud Platform (GCP), Supabase, Visual Studio Code, IntelliJ, Prisma ORM