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Nirjhar Deb

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U.S. Citizen

Education

Georgia Institute of Technology **Atlanta, GA**
B.S./M.S. in Computer Science, GPA 3.72 *May 2026 (Expected)*

- **Concentrations:** Systems & Architecture, Information Internetworks
- **Courses:** Design/Analysis of Algorithms, Systems & Networks, Probability & Statistics, Data Structures, Multivariable Calculus, Linear Algebra, Discrete Mathematics, Computer Architecture, Operating Systems, Real-Time Systems, Databases

Work Experience

Uber – Knowledge Platform **Sunnyvale, CA**
Software Engineering Intern *May 2024 – August 2024*

- Fine-tuned a large language model with retrieval augmented generation, optimizing hyperparameters and enhancing prompts with a 2,700-acronym dictionary to achieve 97% accuracy in feature name recognition.
- Wrote an Apache Spark job to automatically add LLM-generated descriptions for over 2,100 YAML files, leveraging the Hadoop Distributed File System (HDFS) for scalable, remote data storage.
- Implemented a synchronous gRPC gateway in Java to interface with the LLM and created a Python and PHP code linter to backfill 20,000+ descriptions with 5-second API call latency.

Uber – Earner Delivery Risk **Sunnyvale, CA**
Software Engineering Intern *May 2023 – August 2023*

- Created a distributed data streaming pipeline using Java, Golang, and Apache Cassandra to compute and feed a near real-time feature to machine learning models for delivery fraud detection, saving over $14 million yearly.
- Redesigned Java trip-streaming pipeline to filter non-production data, reducing Kafka message delays by 83%.
- Spearheaded a 7-person hackathon project to integrate the GPT-4 large language model in customer service chats using Python, resulting in a 14.3% reduction in time required to detect negative customer behavior.

AT&T – Chief Security Office **Dallas, TX**
Software Engineering Intern *June 2022 – August 2022*

- Upgraded an internal network access service by using Python and Django to transition from cookie authentication to the SAML open standard, providing over 1,300 employees with a more secure, single sign-on process.
- Pioneered a novel infrastructure to stream video games with 70% lower latency, which was prototyped as a C++ text-based game engine and visualized in Figma. This invention is awaiting patent approval (no. 18/148,428).
- Developed scripts in Python, SQL, and HTML to uncover security vulnerabilities by parsing 500+ event logs and by automating data exports to Excel. Written and tested using the PuTTY SSH client.

Research

Georgia Tech Habanero Extreme Scale Software Research Laboratory **Atlanta, GA**
Undergraduate Research Assistant *August 2023 – Present*

- Improved performance of topological sorting algorithm over 20% by removing yield calls in HClib (C++, actor/selector-based) using a global termination protocol for handling acyclic dependencies in distributed systems. Currently writing undergraduate thesis under Dean of Computing, Dr. Vivek Sarkar, and Dr. Akihiro Hayashi.
- Optimized triangle counting with a binary search variant, reducing mean lap times by 10% in OpenSHMEM weak scaling experiments up to 384 processing elements (PEs), evaluated using a SciPy-Pandas t-test script for hypothesis testing that generated PDF reports with graphs and results.
- Enhancing global mailbox termination to support synchronized termination across all PEs for cases with over 215 rows per thread, addressing scalability limitations in Single Program Multiple Data (SPMD) termination.

Projects

- **Nonprofit Organization Research Panel Social Media Analytics:** Scraped 2,660 videos from 56 nonprofit YouTube channels, storing data in a scalable MySQL database with Dockerized integration tests. Used Python (Pandas, VADER) for natural language processing, leveraging sentiment analysis to uncover statistical trends, distributions, and time-series patterns, supporting data-driven decision-making for over 2,800 NGOs.
- **Enhanced xv6 Operating System:** Implemented stack trace debugging, copy-on-write forking, lazy zero-page allocation, custom scheduling algorithms, user space threading library, and large file support up to 8 MB in C.

Skills

Languages: Python, C++, Java, C, Golang, Swift, HTML, SQL, PHP, JavaScript
Frameworks: SciPy, Pandas, Apache Kafka, Apache Spark, JUnit, Spring Boot, Hadoop, Flask, React Native, Flutter, Django
Developer Tools: Linux, Git, Docker, Google Cloud Platform, GDB, Jupyter, Grafana, Visual Studio Code