Arihant Birani

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Education

Georgia Institute of Technology **August 2022 - May 2026**

Bachelor of Science in Computer Science, Minor in Mathematics

Relevant Coursework

- Data Structures
- Intro to ML
- Linear Algebra
- Objects and Design
- Computer Organization
- Applied Combinatorics
- Multivariable Calc
- Artificial Intelligence
- Databases and Systems
- Systems and Networks
- Quantum Computing
- Foundation of Proofs

Technical Skills

Languages/Frameworks: Python, Java, C, HTML/CSS, JavaScript, SQL, PyTorch, React, Node.js, Angular, NumPy
Tools/Databases: Git, IntelliJ, Android Studio, Dynatrace, VS Code, Jupyter Notebook, Eclipse, MongoDB, MySQL
Other: Postman, Terraform, REST APIs, Agile, Dynatrace, Jira, Confluence, Application Insights

Experience

The Travelers Companies **June 2024 - August 2024**

Software Engineering Intern - Engineering Development Program *Hartford, CT*

- Constructed the Get-Loss-Consultation API Endpoint for the OmniAct Web Application, retrieving user records corresponding to User IDs passed in as query strings, writing 20+ test case scenarios to verify its functionality.
- Queried 10k+ User Sessions using U-SQL from the OmniAct Production Database and displayed 40+ significant metrics on the central DynaTrace Dashboard, presenting 20+ new user insights in weekly meetings with the product team.
- Conducted End-to-End API testing by chaining multiple requests together in order to validate complex user journeys.

Projects

Quantum Long Short-Term Memory Stock Trading Model | *Python, PyTorch* **January 2025 - Present**

- Building a QLSTM on IBM Q (12 qubits) to incorporate correlation metrics into neural network inputs, boosting predictive accuracy by 7% over classical ML baselines, while capturing nonlinear feature interactions.
- Processing 1M+ minute-level equity quotes, adding feature engineering and data cleansing, achieving 72% directional accuracy and a 1.3 Sharpe ratio over five consecutive years of backtests on the NASDAQ Composite Index.
- Optimizing hyperparameters via the Quantum Approximate Optimization Algorithm (QAOA), reducing training time by 20% and mean absolute percentage error by 15%, using a parallelized search that leverages quantum heuristics.
- Bridging large-scale quantum simulations and LSTM training in a high-performance computing environment, cutting end-to-end runtime by 30% through distributed GPU nodes and batch job orchestration.
- Deploying a sub-second inference pipeline for real-time trading signals, integrating risk management rules and automated position sizing to outperform a traditional buy-and-hold strategy by 3% annually.

Mentor-Mentee Matching Platform | *JavaScript, MongoDB, PostMan* **June 2024 - August 2024**

- Designed a full-stack platform to match Travelers mentors with mentees by analyzing similarities between lines of business, office locations, and preferred communication styles, ensuring tailored and meaningful connections.
- Populated a mock database with 500+ mentor-mentee pairings to test an enhanced Gale-Shapely matching algorithm.
- Conducted comprehensive API testing via Postman to ensure optimal mentor-mentee matches.

TextWorld Adventure Application | *Python, Visual Studio Code* **August 2024 - Sepetember 2024**

- Designed and implemented 3+ enhanced search algorithms to extensively navigate different game environments.
- Visualized Search Trees and Agent Movement using Graphviz and Pydot for better insight into algorithm performance.
- Applied State Management and Priority Based Decision-Making techniques to handle complex interactions and solve the game's main objectives, such as searching for coins and returning items to specific locations.

GBA Graphical Application | *C, Visual Studio Code* **April 2023 - June 2023**

- Integrated Mode 3 video and DMA functionality with real-time collision detection to leverage the GBA's hardware capabilities for efficient graphics rendering, reducing CPU load by 65% by offloading tasks to the DMA controller.
- Developed logic for smooth object movement, layered background rendering, and interactive text displays, enhancing game play immersion and performance by allowing for environment updates while maintaining 60+FPS.
- Optimized frame rendering to eliminate screen tearing, reducing latency and improving visual quality by over 30%.

2D Dungeon Crawler Application | *JavaFX, Android Studio* **August 2023 - December 2023**

- Collaborated through GitHub to create a navigation-based interactive game with a user-controlled character.
- Designed aesthetically pleasing and interactive gaming interfaces using JavaFX, focusing on responsive controls.
- Increased user accessibility by optimizing the game's performance for mobile platforms using Android Studio, resulting in a 25% reduction in load times and improved compatibility across various devices.