Arihant Birani

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Education

Georgia Institute of Technology **Aug 2022 – May 2026**

Bachelor of Science, Computer Science, Minor in Mathematics

- **Coursework:** Data Structures, Machine Learning, Linear Algebra, Object-Oriented Design, Computer Organization, Applied Combinatorics, Multivariable Calculus, Artificial Intelligence, Database Systems, Computer Systems and Networks, Quantum Computing, Foundations of Proofs, Probability Theory, Automata and Complexity, Computer Vision

Technical Skills

Languages/Frameworks: Python, Java, C, HTML, JavaScript, SQL, PyTorch, React, LangChain, Tensorflow, CrewAI
Tools/Databases: Git, AWS, Azure, Android Studio, Palantir Foundry, Jupyter Notebook, Eclipse, MongoDB, MySQL
Other: Postman, Terraform, REST APIs, Agile, Jira, Confluence, Application Insights

Experience

American International Group **June 2025 - Present**

Data Science Intern *Atlanta, GA*

- Developed an LLM-based agentic pipeline to generate loss descriptions, reducing adjuster review time by 85%+.
- Evaluated 100+ document-level field errors by Anthropic text extraction model across 5+ unstructured formats (PDF, HTML, etc.), conducting root cause analysis to diagnose inaccurate model outputs.
- Designed a structured error taxonomy and conducted frequency analysis on model-ground truth mismatches to guide fine-tuning efforts, resulting in a 30% reduction in critical field extraction failure rates across underwriting submissions.
- Used transformer-based sentence embeddings to match DUNS identifiers across 500+ unstructured policy and claims documents, improving retrieval accuracy by 18%, while greatly reducing manual review workload.

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.
- Collaborated with QA analysts to align API schema design with UI requirements for seamless integration in production.
- 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.

Predictive House-Price Forecasting Application | *Scikit-learn, Tensorflow, Matplotlib* **December 2024 - March 2025**

- Preprocessed the Kaggle House Prices dataset (1460 records, 79 features), addressing 10% missing values and outliers.
- Trained Gradient Boosting regression model (XGBoost) to forecast house prices with an RMSE of $22,000 and R^2 of 0.90, exceeding a naive baseline by 20% while maintaining robust generalization through cross-validation.
- Engineered features by encoding 20+ categorical variables (via one-hot encoding), normalizing 10+ skewed numerical features, and creating new predictors (ex. QualityScore) to enrich model inputs and improve training stability.
- Deployed the final XGBoost model via FastAPI, enabling real-time predictions with a sub-second latency.

Honors & Awards

AIME Qualifier **February 2022**
AMC 12 Distinction (Top 5% nationwide) **November 2022**
AMC 10 Distinction (Top 5% nationwide) **November 2020**