# ARIHANT BIRANI

Atlanta GA, 30308

✉ abirani3@gatech.edu    in linkedin.com/in/arihant-birani    ⌂ Personal Portfolio

## Education

**Georgia Institute of Technology**                                           **August 2022 - May 2026**
*Bachelor of Science in Computer Science, Minor in Mathematics*

## Relevant 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, Computer Networking

## 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%+.
- Evaluating 100+ document-level field errors by text extraction model powered by Anthropic's LLM 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.

**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.

**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**