Aaditya Pemmaraju

aaditya.pemmaraju@gmail.com | 732-956-4819 | US Citizen | linkedin.com/in/apemmaraju2 | github.com/apemmaraju2

Education

Rutgers University – New Brunswick May 2027

Bachelor of Science in Computer/ Electrical Engineering and Computer Science *New Brunswick, NJ*

- Relevant Coursework: Discrete Structures, Data Structures, Systems Programming, Computer Architecture, Electronic Devices, Digital Signals and Systems, Probability and Statistics, Machine Learning, Quantum Information Science, Network Centric Programming, Digital Electronics, System Programming

Experience

Co-Founder Jan. 2026 – Present

Atreides Systems *Remote*

- Building a distributed network and intelligent maritime monitoring platforms that combine computer vision, sensor fusion, and edge computing.
- Architected the ShipAI platform using NVIDIA Jetson edge hardware and multi-sensor data pipelines, reducing maritime bandwidth requirements by approximately 40% through onboard compression and processing.
- Designed real-time AI pipelines integrating camera feeds, IMU/GPS sensors, and anomaly detection models to automate vessel monitoring and operational insights.

Quantitative Research Intern Jul. 2025 – December 2025

GenieWealth Partners *Remote*

- Engineered systematic equity and futures strategies in Python using Pandas and NumPy, achieving Sharpe ratios above 1.0 by designing and testing factor models that generated consistent alpha.
- Built a vectorized backtester for options-flow and dark-pool trade data, reducing runtime by 30% through I/O compression and caching.
- Developed random regression signals with stability regularization, improving signal accuracy by 20% and decreasing drawdown volatility.

Quantum Computing Researcher Oct. 2024 – Jul. 2025

Rutgers University *Piscataway, NJ*

- Implemented CHSH and Magic Square nonlocal games in Qiskit to study quantum communication advantages, analyzing how entanglement and measurement basis selection enable correlations that violate classical Bell bounds.
- Explored quantum information transfer and coordination strategies between distributed players, developing intuition for how shared entanglement reduces classical communication requirements in multi-party protocols.
- Simulated components of Shor's Algorithm in Qiskit, exploring quantum speedups for integer factorization by 18%

Projects

High-Performance Distributed Messaging System | *C++, Linux, TCP/UDP, epoll, Multithreading*

- Built a multithreaded client-server system in C++ using TCP sockets, supporting 100+ concurrent client connections with reliable message delivery.
- Reduced average message latency to under 15ms under concurrent load by optimizing thread handling and socket communication, improving system responsiveness as client connections increased
- Developed a load testing framework to simulate concurrent clients and measure throughput and latency, achieving 2x improvement in messages/sec after performance tuning.

AI Blockchain Agent | *Python, FastAPI, Web3, LLM APIs*

- Developed an autonomous AI agent that analyzed wallet activity, token transfers, and smart contract interactions to summarize blockchain transactions in natural language.
- Integrated LLM reasoning with blockchain data pipelines to automatically generate portfolio explanations and flag suspicious on-chain activity with 90% reliability in testing.
- Implemented scalable backend for real-time agent queries and alerts, reducing blockchain transaction tracing time.

Pitch Accuracy Analyzer | *Python, Librosa, NumPy, Matplotlib, FastAPI, React*

- Built an audio analysis system that processed vocal recordings, extracted pitch contours, and compared detected notes to the intended musical key.
- Engineered a pitch evaluation pipeline using frequency tracking and cent-difference analysis to compute vocal accuracy scores with over 90% note detection consistency.
- Generated pitch contour visualizations and feedback metrics to help artists identify off-key segments.

Technical Skills

Languages: Python, Java, C, C++, MATLAB, SQL, JavaScript, TypeScript, HTML/CSS, Bash
Machine Learning: TensorFlow, PyTorch, NumPy, Pandas, Librosa, Scikit-learn, Qiskit
Developer Tools: Git, Docker, Linux, FastAPI, Node.js, React, Next.js, Web3 APIs, REST APIs, Figma
Interests: Quantum Computing, Music Technology, Cars, Entrepreneurship, Football