

RITHIK BANERJEE

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EDUCATION

COLUMBIA UNIVERSITY — Fu Foundation School of Engineering

New York, NY

B.S. Computer Science, Minor in Applied Physics

Expected December 2026

GPA: **3.95/4.0**; Dean's List

Relevant Coursework: Analysis of Algorithms, Operating Systems, Fundamentals of Computer Systems, Artificial Intelligence, Quantum Computing, Reinforcement Learning, Neural Networks, Linear Algebra & Probability

WORK EXPERIENCE

C SPIRE (promoted from Systems Integration Intern, 1 of 2 interns company-wide)

Ridgeland, MS

AI Solutions Engineer — AI Rapid Response Engineering Team

May 2026 – Present

- Architected and shipped a production voice-AI billing platform connecting WebEx, AWS, and real-time LLM inference (~1.5 s latency), replacing proposed **\$3M+ vendor solution**, and establishing C Spire's standard architecture for future voice-AI products, saving **100+ development hours monthly**.
- Led a platform production security review for the distributed AI architecture spanning gRPC, AWS, private VPN infrastructure, and WebSockets; produced deployment audit documentation for cybersecurity approval.
- Built & deployed a production LLM-based agent automating HR onboarding, saving **80+ HR staff hours/month**.
- Migrated an existing AI application onto a reusable production framework, extending adoption across teams and enabling additional AI products projected to save **50+ engineering/customer hours** each.
- Led technical development of a field-service automation platform integrating REST APIs, Kafka, Redis, and internal databases to sync status across ServiceNow and Jira for **100+ field technicians**, saving them **80+ hours/month**.
- Resolved **20 production issues** across six microservices using Grafana and distributed tracing; authored structured validation procedures supporting **100+ commits** on production deployments.

COLUMBIA UNIVERSITY FUSION RESEARCH CENTER

New York, NY

Software Engineer — Scientific Computing

Feb 2025 – Present

- Developed 10+ Python optimization tools using SIMSOPT to generate **1000+** coil/plasma configurations for a hybrid tokamak-stellarator reactor, reducing magnetic-field error to **~0.01%**; optimized designs now inform physical coil construction on Columbia's HBT tokamak.
- Modernized the computational modeling pipeline by porting a legacy Fortran vacuum-field solver to Julia (OpenFUSIONToolkit/GPEC), validating output parity with the reference implementation; built a GitHub Actions CI pipeline automating testing and documentation for every pull request.
- Automated HPC optimization workflows for unattended batch execution, adding constraint-aware logging (maximum coil curvature) to ensure optimized reactor designs remained physically manufacturable.
- Co-authored a **peer-reviewed arXiv preprint** on a hybrid tokamak-stellarator design; presented findings at 2 symposia.

PROJECTS

CRUCIBLE — High-Performance Chess Engine

C++20

- Built a UCI-compliant chess engine in C++20 featuring magic-bitboard move generation, incremental Zobrist hashing, and a 14-technique alpha-beta search framework. Achieved **2468 Elo** against Stockfish and verified correctness with a **119-million-node** perf (performance test).

FISH — Distributed Multiplayer Game Server

Node.js, WebSockets

- Architected and deployed an authoritative multiplayer game server in Node.js using WebSockets, implementing deterministic server-side state management, secure reconnection, and imperfect-information AI; validated with four automated integration test suites and deployed on Render and Vercel.

FPL TEAM MANAGER — Autonomous Decision Engine

Rust

- Built an autonomous Fantasy Premier League manager in Rust by reverse-engineering the league API to automate transfers, lineup selection, and chip strategy. Designed independent optimization models for season-long transfer planning and weekly lineup decisions with idempotent execution, dry-run testing, and automated GitHub Actions deployment every six hours.

TECHNICAL SKILLS

Languages: Python, Java, C++, C, JavaScript/TypeScript, Rust, Scala, Julia, SQL, HTML/CSS

Systems & Backend: REST APIs, gRPC, WebSockets, Apache Kafka, Redis, Microservices Architecture, Distributed Systems, System Design, Multithreading, Linux

Cloud & DevOps: AWS, CI/CD (GitHub Actions), Unit & Integration Testing, Git/GitHub/GitLab, Grafana, Vercel, Render

Web & Data: React, Next.js, Node.js, SQL, SQLite, NumPy

AI/LLM: LLM Agent Development, Vercel AI Gateway, Claude API, Conversational & Voice AI