

Jason Bhalla

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EDUCATION

Stevens Institute of Technology | *B.S. Computer Science; B.S. Mathematics; GPA: 4.0* 9/2023 – Present

- **Graduate Certificates:** Software Engineering; Machine Learning; Data Science and Data Engineering
- **Selected Courses:** Databases, Distributed Systems, Cloud Computing, Operating Systems, Concurrent Programming, Deep Learning, Software Metrics, Data Mining, Systems Programming, Programming Languages, Theory of Computation, Quantum Information, Security, Computer Architecture, Algorithms, Data Structures, Discrete Structures, Linear Algebra, Nonlinear Optimization, Stochastic Calculus, Intermediate Statistics, Probability Theory, Proofs
- **Involvement:** CS Club (*President*), Society of AI (*Co-Founder; Head of Research*), ACM Chapter (*Founder*), CS Dept Advisory Council (*Advisor*), Math Dept Advisory Board (*Class of 2027 Rep.*), Endowment Quant Fund (*Team Head; Quant Analyst*), Honor Societies [G&T (*Honor Chair*), UPE, PME], Math Club, Linux Club, Women in CS, ColorStack, SWE Club, Physics Society, NYC Group Theory Coop., NYC AI Furnace, Homeless Services Volunteering

EXPERIENCE (PROFESSIONAL & RESEARCH)

Software Engineer Intern | *Advantest* 05/2025 – Present

- Designing and shipping a modular driver framework and ATE software for semiconductor test subsystems, enabling concurrent orchestration of heterogeneous instruments, reliable execution at scale, and efficient performance evaluation.
- Implementing fault-tolerant hardware driver modules in the central test platform with rigorous input validation, bounded retries, structured error telemetry, and graceful degradation, hardening interfaces against device/I-O failures.
- Instrumenting components with structured logging and metrics; adding automated CI checks and tests to catch regressions early and support fast, low-risk deployments; documenting APIs and usage patterns for reuse across projects.
- Collaborating with hardware, firmware, and test engineering to design, test, deploy, and maintain solutions end-to-end.

Undergraduate Researcher | *Stevens Department of Mathematics* 09/2025 – 12/2025

- Constructed and analyzed novel families of abstract linear spaces and incidence geometries, rigorously testing axiom systems and classifying resulting structures via group actions, combinatorial invariants, and graph-theoretic encodings.

Undergraduate Researcher | *Stevens Department of Mathematics* 05/2025 – 12/2025

- Discovered novel finite sofic approximations of infinite discrete groups via labeled Cayley graphs, using group and representation theory and combinatorics to extract invariants and quantify residual finiteness and spectral properties.

Undergraduate Researcher | *Stevens Department of Physics* 06/2024 – 08/2024

- Developed models to test quantum information algorithms, including quantum state estimation, error-correcting code design, and entanglement distribution, analyzing computational complexity, convergence, and realistic noise robustness.

SELECTED PERSONAL PROJECTS

MidiCompiler | *ML, Feature Eng., Offline Eval. (MRR/NDCG), Model Serving (FastAPI), Info. Retrieval (BM25), LTR, GBTs*

- A query reformulation system using BM25 retrieval and LightGBM (TF-IDF baselines) to predict if rewrites improve relevance and rank “nudge suggestions”, boosting MRR/NDCG in a reproducible offline eval and interactive demo UI.

Cognitive Pathfinder | *Python, Full-Stack, Graph Algorithms, Geospatial Analysis, APIs, UI/UX, Optimization, Cloud, Theory*

- A multimodal graph-theoretic and API-based routing engine providing a personalized pathfinding algorithm based on user-specific costs, finding the optimal route/path that optimizes a user’s preferences rather than strictly travel time.

Lincidence & PBHigman | *Python, Full-Stack, Big Data, Deep Learning, Optimization, Simulation, Graph Algorithms, Theory*

- A modular library implementing iterative generators for incidence-style data models, with efficient graph-based storage, validation pipelines, and visualization components optimized via profiling, unit tests, and continuous integration.
- Transformer-augmented local-search pipelines over large graph state spaces using custom heuristic operators, deep learning, and automated hyperparameter tuning to learn scalable finite approximations of infinite algebraic structures.

Multifactor Security Model | *Python, Predictive Modeling, Time Series Data Analysis, Automation, Optimization, Statistics*

- A fully systematic platform for a \$1M fund, including end-to-end pipelines for factor construction, portfolio optimization, performance tracking, automated data ingestion/cleaning, and experimentation with advanced academic models.

LANGUAGES & SKILLS, HONORS & AWARDS, INTERESTS

- **Languages & Skills:** Python, C++, Java, C, C#, Git, OCaml, Go, Linux, ML, Full-Stack, End-To-End, User-Facing SW, UI/UX, Maps, Infra, DBMS, Cloud, Theory, Optimization, Devices, Services, Silicon, SW/FW/HW Integration
- **Honors & Awards:** Dean’s List (Every Semester), Edwin A. Stevens Scholar, Presidential Achievement Scholar, SSMIF Top Scholar, UPE National Scholar, PME National Scholar, Stevens G&T University Scholar, Eagle Scout
- **Interests:** ① Consumer & Enterprise Products, ② Systems & Infrastructure, ③ Theoretical Computer Science & Math