

Aaryan Patel

SYSTEMS AND ML INFRASTRUCTURE ENGINEER

I build systems that survive faults, bad data, and dishonest benchmarks.

aaryansp26@gmail.com

github.com/asp53826

asp53826.github.io

linkedin.com/in/aaryanpatelsystems

SELECTED SYSTEMS

raft-mvcc 598 assertions across seeded faults

Consensus, serializable snapshots, and machine-checkable histories.

Proof: Five-node failover completes in 11 simulator ticks while minority leaders cannot commit.

edgar-mcp 138x warm 10-K read vs cold fetch

SEC EDGAR tools with bounded context, caching, and global pacing.

Proof: 32 offline tests; peak request windows stay at the SEC 10 requests-per-second ceiling.

track-fusion 47% localization error reduction

IMM, JPDA, track scoring, and OSPA from the filter up.

Proof: 67 tests; IMM coverage rises from 0.893 to 0.960, while the published sweep shows where the bank loses.

ADDITIONAL MEASURED WORK

columnar-engine	53.1M rows/s; 6,288 assertions; 1.94x scalar filters
annlite	1.83x FAISS at 0.999 recall; exact-recall curve
vio-nav	51.9x lower drift at 40 seconds; publishes hover failure
vllm-lite	94% vs 21% KV utilization; 90 tests
dst-harness	12/12 planted defects; 2,000-seed clean control

EVIDENCE STANDARD

- Every metric names its units and comparison baseline.
- Every flagship result includes a clone-and-test command.
- Failure boundaries stay beside the claim instead of in fine print.
- External oracles are preferred where they exist: analytic theory, FAISS, torch.distributed, CaDiCaL, and drat-trim.

TECHNICAL RANGE

SYSTEMS	Raft, MVCC, WAL, LSM/SSTables, SIMD, SAT solving
ML INFRA	PyTorch collectives, HNSW, paged KV, retrieval evaluation
SIGNAL	SAR, Kalman/IMM, JPDA, MSCKF, QPSK/LDPC
FINANCE	SEC EDGAR, XBRL, limit order books, AAD Greeks

ENGINEERING CONTRACT

Build the mechanism. Attack the assumptions. Measure against a real baseline. Publish where it loses.

CORE METHODS

- C++17 and Python
- Distributed systems
- MVCC and storage engines
- Fault injection
- Linearizability checking
- Differential testing
- Numerical and analytic oracles
- ML inference and retrieval
- Signal processing and estimation
- Financial data infrastructure

CURRENT WORK

MP Equipment

Automation and analytics: dashboards, ERP workflows, and AR/AI for industrial food processing.

EDUCATION

University of Georgia

Computer Science undergraduate

RECRUITER ROUTES

Systems

raft-mvcc / columnar-engine / dst-harness

Quant / Finance

edgar-mcp / aad-greeks / lob-market-making

Defense / Autonomy

track-fusion / sar-focus / vio-nav

ML Infrastructure

annlite / vllm-lite / dist-train