

HETUL PATEL

Machine Learning & Quantitative Systems Engineer

Hetul.patel.career@outlook.com | (+1) 334-549-1155 | Prattville, AL | [Portfolio](#) | [GitHub](#) | [LinkedIn](#)

SUMMARY

Machine Learning and Systems Engineer with a 4.0 GPA (MS, in progress), specializing in quantitative research infrastructure, vector retrieval systems, and applied ML for signal processing. Built and deployed production-grade systems for large-scale strategy evaluation (60,000+ trading strategies) and high-performance vector search (12.7x compression, recall parity with FAISS). Conducting peer-reviewed hyperspectral imaging research. Seeking full-time roles as a Quantitative Developer, ML Engineer, AI Engineer, or MLOps Engineer starting May 2027.

EDUCATION

Master of Science in Computer Science, Auburn University at Montgomery (AUM)

Aug 2025 – May 2027

GPA: 4.0/4.0 | Focus: Machine Learning, Algorithms, Systems, Quantitative Methods

Montgomery, AL

Bachelor of Science in Computer Science, Auburn University at Montgomery (AUM)

Jan 2018 – Dec 2022

Montgomery, AL

RESEARCH & PUBLICATIONS

Research Assistant — Hyperspectral Signal Modeling, AUM

Jan 2026 – Present | Montgomery, AL

- Designed and trained an end-to-end Gaussian channel-selection model with a compact MLP predictor head to identify spectrally meaningful bands from 462-channel hyperspectral imagery (389-1004 nm); found 6 learned channels retain near-complete predictive power for photon flux ratio ($R^2 = 0.979 \pm 0.015$ across 10 random seeds), with channel center wavelengths converging consistently regardless of initialization
- Ran a follow-up radiance transfer experiment, freezing the learned 6-channel configuration and retraining only the MLP head for a second target variable, achieving $R^2 = 0.999 \pm 0.0006$ — demonstrating a single optimized camera design can support multiple measurement objectives
- Co-authoring manuscript for submission to Atmospheric Measurement Techniques (AMT), a peer-reviewed journal (target: July 2026)

EXPERIENCE

Software Developer, Takeo Tech LLC

Jan 2023 – Aug 2025 | New York, NY

- Built internal analytics dashboards (Flask, PostgreSQL, SQL) to track student enrollment, course completion rates, and revenue performance across multiple bootcamp programs
- Designed and maintained scalable ETL pipelines (Python, Spark, AWS) to consolidate multi-source enrollment, engagement, and payment data for executive reporting, with PII masking and role-based access control

IT Support Technician (Part-Time), AUM

Feb 2026 – Present | Montgomery, AL

- Resolve 15-20+ technical support tickets daily for students, faculty, and staff, covering account access, authentication systems, password resets, and device/printer troubleshooting in a high-volume university help desk environment
- Diagnose and escalate hardware, software, and network issues across a mixed environment of university-managed workstations and personal devices

PROJECTS

Aegisure — Founder & Engineer | [PyPI](#) | [GitHub](#)

- Building a vendor-neutral audit and control plane for AI coding agents (Claude Code, Codex, Cursor, Copilot), enforcing policy at the commit/PR layer via a webhook-based event pipeline (GitHub) and governance dashboard; published CLI tool (v0.2.1) on PyPI, validated against real-world repositories

GSIN — Global Strategy Intelligence Network | [Live Demo](#) | [GitHub](#)

- Built a self-evolving research platform that generated and evaluated 60,000+ systematic trading strategies via a genetic-algorithm evolution engine with adaptive mutation and regime-aware optimization, validated using walk-forward and Monte Carlo analysis; built backtesting and paper-trading infrastructure (FastAPI, PostgreSQL, Redis) with background workers for continuous evolution and monitoring

Veclite — Hierarchical Vector Routing & Retrieval Engine | [Live Demo](#) | [GitHub](#)

- Built a production-ready vector database achieving 12.7x compression with recall parity to FAISS (Recall@10 = 0.921) and <40ms p95 latency at 100K+ vectors via two-stage retrieval (cluster routing + exact reranking)
- Implemented multi-tenant backend (FastAPI, Redis, PostgreSQL/Supabase) with snapshot-swap indexing for non-blocking ingestion and search under 200 QPS load testing

SKILLS

Quantitative & Trading: Probability & Statistics, Time-Series Modeling, Monte Carlo Simulation, Genetic Algorithms, Portfolio Optimization, Backtesting, Walk-Forward Analysis, Market Microstructure, Systematic Trading Strategies

Machine Learning & NLP: PyTorch, Scikit-learn, NumPy, Pandas, Vector Search, Retrieval Systems, NLP, Hugging Face, Signal Processing

Systems, Backend & Cloud: Python, C++, SQL, FastAPI, REST APIs, Distributed Systems, Redis, PostgreSQL, Docker, AWS, CI/CD, Railway, Supabase