Varun Budati

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EDUCATION

Virginia Tech, Blacksburg, Virginia — Aug 2023 – May 2027 — CFA Level 1 Candidate
B.S. in Computer Science — GPA: 3.61/4.0
Minor in Mathematics & Finance

SKILLS, COURSEWORK & CERTIFICATIONS

Programming Languages: Python, SQL, JavaScript, Java, C, HTML/CSS

Libraries & Frameworks: NumPy, Pandas, Matplotlib, Plotly, Sklearn, Seaborn, SciPy, Statsmodels, React, Node.js, Flask

Developer Tools & OS: Git, Docker, AWS, Linux/Unix

Certifications: Financial Analysis (Power BI), Akuna Capital Options 201 (ID: 92400251)

RESEARCH EXPERIENCE

Quantitative Research, Dataism Lab for Quantitative Finance - Virginia Tech, Blacksburg, Virginia — October 2024 – Present

- Investigating context-management evolution in financial LLMs by benchmarking the GPT-OSS 20B model on FinanceBench, evaluating the effectiveness of manual context curation versus automated RAG and Model Context Protocol (MCP)
- Created a data-driven market simulator that successfully trained an agent on a 3-day historical Bitcoin dataset, demonstrating the model's ability to learn and exploit short-term liquidity patterns.
- Developed a Deep Reinforcement Learning agent in PyTorch, implementing Double Dueling DQN with Prioritized Replay to learn optimal execution policies from high-frequency data.

Summer Research Intern, MAOP - Virginia Tech, Blacksburg, Virginia — May 2025 – July 2025

- Analyzed 24,500+ words from intro CS courses at MIT, Berkeley, and CalTech to find pedagogical gaps.
- Developed an 8-category coding framework and utilized LIWC-22 and LLMs to classify programming examples by thematic focus.
- Delivered data-driven recommendations using LIWC-22 after finding a 57% prevalence of abstract examples, advocating for culturally-relevant, real-world applications.

Research Mentor & Assistant, REACH Lab - Virginia Tech, Blacksburg, Virginia — March 2024 – June 2025

- Conducted an extensive literature review on Rural Computer Science Education, synthesizing over 80+ articles and papers to support a $500,000 National Science Foundation (NSF) grant proposal.
- Mentored and trained 6 research assistants in advanced literature review methodologies and database search techniques.

PROJECT WORK

ShadeFinder | Software Engineering Project — December 2025

- Developed a geospatial web application to visualize real-time building shadows for urban heat mitigation, enabling pedestrians to identify cooler walking corridors in extreme heat climates.
- Engineered a Python-based shadow calculation engine integrating OpenStreetMap and Pysolar to project shadow polygons using solar physics (altitude/azimuth) and building height metadata with Earth curvature compensation.
- Built an interactive Streamlit dashboard with Folium maps displaying shadow visualization, hourly simulation controls, and real-time climate data from OpenWeatherMap API; also developed a React/FastAPI version with Mapbox GL JS for 3D building rendering.

Undergraduate Commodities Competition — October 2025

- Constructed a suite of quantitative models to price a natural gas basis trade, including a multiple regression to identify market drivers ($R^2 = 0.40$) , an Ornstein-Uhlenbeck process for temperature, and a B-Spline volatility model for pricing weather derivatives.
- Structured and executed a multi-leg trade thesis (Short Jan '26 Waha Basis), using 10,000 Monte Carlo simulations to value the hedges (Henry Hub call spread and Dallas HDD options) and define a comprehensive risk-payoff profile.

LEADERSHIP & EXTRACURRICULAR ACTIVITIES

Treasurer, FinTech Club, Virginia Tech, Blacksburg, Virginia — October 2024 - Present

- Manage the club's budget and all financial operations to fund initiatives and workshops for a community of 100+ members.
- Organize speaker events with industry professionals to create networking and career development opportunities.
- Led a faculty-advised research project replicating the foundational Evans & Archer (1968) paper on portfolio diversification.
- Modeled risk vs. portfolio size (Pandas, NumPy), confirming unsystematic risk is mitigated with 10-20 assets.

IMC Prosperity 3 | Top 0.005% — April 2025

- Placed 15th in the US out of 12,600 teams in IMC's Prosperity 3 trading competition, designing strategies for multi-asset markets.
- Optimized trade execution constraints by using fair value estimators (VWAP, EMA, stochastic modeling).
- Designed signal-driven market-making strategies by analyzing mean-reversion patterns and synthetic mispricing via EDA (rolling z-scores, spread compression, correlation clustering).