Blake Law

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Education

Georgia Institute of Technology Expected Dec 2024
Bachelor of Science in Mathematics GPA: 3.91

- **Relevant Coursework**: Money & Capital Markets, Advanced Macroeconomics, Real Analysis, Mathematical Statistics I & II, Advanced Linear Algebra, Probability Theory, Object Oriented Programming, Numerical Analysis
- **Achievements**: Dean's List (x5), Tom Morley Award (top 2% of students in Calc III), Putnam Score: 11

Experience

Researcher — Equity Research Boutique – Georgia Tech Aug 2024 – Dec 2024

- Building valuation models to track public transportation and technology stocks based on historical 10-K filings

Data Science Intern, Perpay – Philadelphia, PA June 2024 – Aug 2024

- Reverse engineered VantageScore 4.0 and Clear Credit Risk scoring algorithms (RMSE: 19.1, 6.8) with gradient boosting on 140k users with 3k features, leading to understanding of how storefront impacts credit scores
- Reduced model-training time by 97% while maintaining high accuracy by removing 2900 low-impact variables
- Provided clear, actionable insights on how user behaviors affect credit scores through partial dependence plots and LIME on gradient boosting model, resulting in a frontend widget that personalizes score impact
- Updated credit reporting DAG in Airflow to update 7,000 migrated users; added quality checks and unit tests
- Refactored company-wide repository to support boto3, leading to streamlined batch AWS S3 uploads

Teaching Assistant – Georgia Tech Department of Mathematics May 2023 – Dec 2023

- Provided feedback for exams and assignments in three advanced statistics and one PDE class

Projects

Federal Funds Rate Forecasting – Python, R, Pandas, NumPy

- Compared CME FedWatch to Kalshi for federal funds rate forecasting with API requests, pandas, and NumPy
- Found that Kalshi outperformed CME by 0.12% over the three FOMC meetings with a novel forecasting metric
- Featured and interviewed for a front page MarketWatch story on federal funds forecasting

Online Inflation Tracker – PostgreSQL (PostGIS/TimescaleDB), EC2, MongoDB, Dagster

- Collected 1.5 million fully-categorized prices daily from 600+ vendors including grocery, gas, and drug prices
- Designed normalized Postgres database to efficiently store data with B-tree and spatial indexing
- Constructed event-driven architecture using Dagster and EC2 to schedule and perform ETL on a daily basis
- Developed product index dashboards using Next.js frontend with a REST API querying MongoDB backend

Algorithmic Trading in Decentralized Prediction Markets – Python, SQL, Apache Airflow, Docker, web3

- Developed an algorithm in Python to replicate trades of Ethereum addresses on Polymarket, a decentralized prediction platform, to assess the effects of high information symmetry on return
- Created data pipeline with Airflow and Docker to store trades placed by Polymarket superforecasters
- Found that retroactively applying the algorithm to superforecasters produced a 1.2% return after fees in 2022, constrained by low liquidity and high bid-ask spreads

Skills

Languages: Python, SQL, R, JavaScript, MATLAB, Go
Libraries: pandas, NumPy, scikit-learn, PyTorch, Matplotlib, NLTK, SciPy, TensorFlow
Tools: Tableau, Airflow, Excel, Git, LaTeX, MongoDB, Linux, Docker, Kubernetes, dbt, MLFlow
ML/Stats: A/B Testing, Causal Inference, Regression, NLP, Gradient Boosting, Neural Networks
Big Data: AWS (S3, EC2, Redshift), Spark, Hadoop, Azure, GCP (Vertex), Databricks, Elasticsearch