Michael Stafford

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https://mraystaf.github.io/PersonalWebsite/

Education

BS, Applied & Computational Mathematics Emphasis (ACME)
Second Major: BS, Economics **December 2024**
Brigham Young University *Provo, Utah*

- ACME Emphasis: Economics and Financial Markets
- GPA: 3.97
- Relevant Coursework:

Linear and Nonlinear Analysis	Computer Science	Multivariable Calculus
Computation and Optimization	Mathematical Programming	Price Theory
Econometrics	Financial Markets	

Experience

Research Assistant – Computer Vision **September 2024 – Present**
Brigham Young University Economics Department – Record Linking Lab *Provo, UT*

- Implemented and maintained object detection models to programmatically interpret census records.
- Explored key point detection models to detect census record gridlines using python's mmpose library.

Software Engineer **May 2023 – September 2024**
Select Bankcard *Lehi, UT*

- Created a monitoring system that uses SQL stored procedures to examine internal services.
- Developed a file compression system to compress over 2 million files.
- Managed an internal application and its associated API, using C#, Angular, and SQL.

Skills

- Proficient in C#, SQL, C++, and python (numpy, pandas, statsmodels, pytorch, and sklearn libraries).
- Basic knowledge of Stata, Angular, and HTML.
- Mathematics Skills:

Numerical optimization	Dynamic optimization	Fourier analysis & Wavelets
Numerical linear algebra	Gaussian quadrature	QR and singular value decompositions
Importance and rejection sampling	PageRank algorithm	Thompson sampling
Machine learning/neural networks	Hidden Markov models	State-space models
Kalman filter	ARIMA models	Mathematical statistics
Bayesian modeling	Sampling (MCMC)	Modeling with differential equations
Dynamical systems	Optimal Control	Numerical methods for differential equations

Relevant Projects

Battle of the Quants – 2nd Place Finish

- Collaborated with a team to build a quantitative trading strategy based on past stock data in python (pandas library).
- Used the Fama and French 5 factor model, OLS, and a binning strategy to generate monthly portfolios.
- Presented our results using a jupyter notebook and a slide presentation

Time Series Analysis: United States GDP

- Used the Kalman Filter, an ARIMA model, and structural models to filter and predict GDP trends in the United States.
- Coauthored a paper and presented our results