

Quantitative researcher and economist specializing in real estate analytics and computational methods. I combine high-performance computing, machine learning, and economic theory to analyze complex market dynamics. My research spans urban development, housing markets, and financial modeling, using tools like TensorFlow and Julia to process massive datasets. Looking to apply my expertise in economic modeling and data science to solve challenging business problems.

SKILLS

Programming Languages	Python, Julia, R, MATLAB, STATA, STAN, C++ (Novice)
Machine Learning	TensorFlow, Scikit-learn, Keras
Statistics	Bayesian Methods, Time Series Analysis, Monte Carlo, MCMC
Scientific Computing	Numerical Optimization, Stochastic Processes, Asset Pricing Models, Simulation-based Inference, Regime-switching Models
Software Development	Git, GitHub Actions, Unit Testing, Documentation Generation, Code Coverage, CI/CD
Data Analysis & Tools	NumPy, Pandas, Polars, data.table, SQL, Unix, HPC Clusters
Languages	English (Fluent), Spanish (Novice)

EXPERIENCE

Assistant Professor <i>Chapman University, Argyros College of Business and Economics</i>	August 2020 — Present Orange, CA
<ul style="list-style-type: none">Conducted research on real estate market dynamics, including pricing, risk management, monetary policy impacts on commercial real estate, housing affordability, and zoning uncertainty effects. Published in top field journals with actionable insights for urban planning and investment. [Research Portfolio]Designed and implemented large-scale Monte Carlo deep learning experiments using high-performance computing, simulating 1.5M+ targets in 55-dimensional parameter spaces with TensorFlow and optimized Julia code.Developed novel econometric methods and constructed comprehensive NYC real estate panel dataset (48M+ observations, 118 variables) to analyze urban development costs, regulatory impacts, and property market dynamics. [Paper]Presented research at prestigious institutions including MIT, UCLA, UC Irvine, and Federal Reserve; teaching graduate/undergraduate courses in Real Estate Economics and Macroeconomics.	
Research Affiliate <i>Kenan Flagler Business School, University of North Carolina at Chapel Hill</i>	August 2020 — Present Chapel Hill, NC
Dissertation Fellow <i>Federal Reserve Board of Governors - Research & Statistics Division</i>	Summer 2019 Washington, DC
Visiting Researcher <i>NYU Center for Urban Science + Progress</i>	Summer 2018 New York, NY

PROJECTS

QuadraticKalman.jl - Open Source Scientific Computing Package

Julia Package for Quadratic State-Space Models [[Github](#)]

- Developed and maintain a high-performance Julia package for Kalman filtering with quadratic measurement equations, achieving a **10x-60x speedup** over existing implementations.
- Implemented **automatic differentiation** for gradient and Hessian computation, enabling efficient optimization and inference.
- Built a comprehensive **CI/CD pipeline** with unit testing, documentation generation, and code coverage using GitHub Actions.
- Implemented the framework with a focus on numerical stability for robust parameter estimation.

NYC Building Permit Dashboard - Interactive Urban Data Visualization

Interactive web app for exploring NYC building permit data [[Dashboard](#)] [[Github](#)]

- Developed a dynamic dashboard using **Python**, **Dash**, and **Plotly**, providing interactive visualization of NYC building permit trends across time and space.
- Leveraged advanced **geospatial analytics** with **GeoPandas**, **pandas**, and Uber's **H3** hexagonal global indexing system to create interactive **choropleth maps** and **time-series** visualizations.
- Implemented synchronized dual-map views and intuitive controls for precise spatial and temporal analysis.
- Engineered a modular, scalable architecture with automated **CI/CD** pipelines, achieving **90% code coverage** and ensuring high performance and maintainability.

EDUCATION

Doctorate of Philosophy in Economics , <i>University of North Carolina at Chapel Hill</i>	2020
Master of Science in Economics , <i>University of North Carolina at Chapel Hill</i>	2018
Bachelor of Business Administration in Finance , <i>University of Massachusetts at Amherst</i>	2013