Yu Shao

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EDUCATION

Boston University, Boston, MA 08/2019 - 05/2024
Ph.D. in Statistics, Overall GPA: 4.0/4.0
Honors: Outstanding Teaching Fellow Award (2021), Dean's Fellowship (2019)
Advisor: Dr. Ting Zhang

Johns Hopkins University, Baltimore, MD 08/2017 - 05/2019
Master of Science in Engineering in Financial Mathematics, Overall GPA: 4.0/4.0
Honors: Outstanding Master's Research Award (2019)

Renmin University of China, Beijing, China 09/2013 - 06/2017
Bachelor of Science in Mathematics and Applied Mathematics, Overall GPA: 3.78/4.0
Bachelor of Engineering in Computer Science, Overall GPA: 3.78/4.0
Honors: Beijing Outstanding Graduate (2017), Jingdong Scholarship (2016), Excellent Student Cadre (2015)

INDUSTRY EXPERIENCE

Senior Business Consulting 09/2024 - Present
Ernst & Young LLP New York, NY

- Contributed to the development of an anti-money laundering (AML) warning system for commercial banks, leveraging decision systems and logistic regression models for effective risk detection; integrated sentiment analysis on client transaction descriptions using Large Language Models (LLM) to enhance detection accuracy.
- Assisted in designing an automated credit and identity verification process for new account openings at commercial banks, using fuzzy matching and free-text analysis to cross-reference client information.
- Applied statistical tests for transaction sanction thresholds validation and implemented decision trees for results aggregation from multiple thresholding methods, ensuring a robust and efficient screening process.

Portfolio Management 09/2023 - 03/2024
Stepstone Group La Jolla, CA

- Conducted prompt engineering to enhance Large Language Models (LLM) training for extracting and structuring insights from unstructured financial data in the private equity space, resulting in the automated generation of structured financial reports and analyses.
- Performed time series analysis of net asset values at the industry and sector levels for US and EU private equity markets, delivering comprehensive risk analysis on the impact of foreign interest rates.
- Developed methodologies for quarterly interpolation of unrealized asset values using private equity cash flows, addressing data gaps and inconsistencies in the database to improve accuracy and completeness.

Quantitative Researcher Intern 06/2023 - 08/2023
IMC Trading Chicago, IL

- Constructed time-varying statistical models based on real-time trading data to identify trading signals from option implied volatility skew; designed and implemented option portfolios for signal capturing.
- Performed backtesting Profit and Loss analysis and sensitivity assessments using advanced option theory, resulting in dynamic optimization strategies for option position profitability maximization.

Data and Quantitative Analytics Intern 01/2023 - 05/2023
Stepstone Group La Jolla, CA

- Developed multi-factor models for portfolio management across private debts, infrastructure, venture capital and private equity; integrated into a Daily Valuation Engine for daily private equity pricing approximation based on public market data.
- Refined private equity portfolio return forecasting models and performed critical sensitivity analysis, enhancing model accuracy and robustness, and delivering actionable insights for predicting private market trends.

RESEARCH EXPERIENCE

Research Assistant 05/2022 - 09/2022 & 07/2024 - 09/2024
Department of Statistics, University of Georgia Athens, GA

- Investigated tail index estimation for a general class of tail-dependent time series, establishing asymptotic theories via martingale approximation; applied to a robust mixture tail clustering (RMTC) algorithm, validated through Monte Carlo simulations and stock return clustering analysis within Russell 3000 Index.
- Utilized nonparametric statistical methods and deep neural networks for real-time blood pressure estimation in a contact-free sleep monitoring system, achieving a mean absolute error (MAE) within 3 mmHg.

Research Assistant 09/2019 - 05/2024
Department of Mathematics and Statistics, Boston University Boston, MA

- Proposed local linear nonparametric estimators for high quantiles in nonstationary tail-dependent time series with asymptotic theories developed; applied to time-varying Value at Risk estimation for Nasdaq 100 Index.
- Proceeded statistical inference and visualization of time-varying correlation functions in settings of non-stationary time-series using locally homogenized centering scheme with applications in financial indices and COVID data.
- Implemented stratified penalized kernel method to simultaneously label and estimate semiparametric coefficients in time-varying regression models with Monte-Carlo study and numeric experiment in global temperature series.

Research Assistant 12/2017 - 05/2019
Applied Mathematics and Statistics Department, Johns Hopkins University Baltimore, MD

- Developed theoretical framework for analyzing distributed denial of service attacks using stochastic fluid queues.
- Modeled transient behavior of stochastic fluid queues for theoretically assessing corporation ruins in financial network contagion and resource allocation deficiencies in supercomputing systems.

Research Assistant 08/2015 - 06/2017
Lab of Information System Application, Renmin University of China Beijing, China

- Enhanced credit card fraud detection accuracy by researching feature engineering techniques and integrating them into ensemble learning models for business operational risk.
- Developed an automated, event-driven trading strategy combining quantitative analysis with sentiment data from internet media, significantly outperforming baseline models.
- Extracted sentiment indices from agricultural news databases and public media to forecast agricultural prices and stock index fluctuations using machine learning models and ensemble methods.

PUBLICATIONS & RESEARCH WORKS

- Hanyue Cao, Jingying Gao, Yu Shao, T. N. Sriram, Weiliang Wang, Fei Wen, and Ting Zhang. *Tail index estimation for tail adversarial stable time series with an application to high-dimensional tail clustering.* Journal of Time Series Analysis (2024).
- Ting Zhang and Yu Shao. *Time-varying correlation for non-centered non-stationary time-series: simultaneous inference and visualization.* Statistica Sinica 34 (2024), 1-20.
- Ting Zhang, Weiliang Wang, and Yu Shao. *A stratified penalization method for semiparametric variable labeling of multi-output time-varying coefficient models.* Statistica Sinica 33 (2023), 1025-1045.
- Antwan Clark, Yu Shao, Jiawen Bai, Giovanni Berrios, and Nicole Fleming. *Large Scale Storage Simulation (L-S3) Module for HPC Environments.* JHU Invention Disclosure, April 2022.
- Antwan Clark, Yu Shao, Jiawen Bai, Giovanni Berrios, and Nicole Fleming. *Node-Local Burst Buffer Reliability Analysis Framework.* JHU Invention Disclosure, Febrary 2022.
- Yu Shao, Jiawen Bai, Ning Liu, Kun Wang, and Antwan Clark. *Asymptotic transient solutions of fluid queues fed by a single ON-OFF source.* IEEE Annual Ubiquitous Computing, Electronics and Mobile Communication Conference (UEMCON), New York, USA, November 2018.

PROFESSIONAL SKILLS

- Computer Skills: Python, R, C, C++, Java, MATLAB, SAS, VBA, and PL/SQL
- Certificate: Chartered Financial Analyst (CFA) Level III Passed