Richard Y. CHEN

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Employment

Amazon

Applied scientist II   2023/04 - present
Applied scientist I   2021/09 - 2023/03
· Build and improve machine learning models for customer risk prediction;
· Predict downstream customer impact using heterogeneous causal machine learning;
· Design and implement online A/B tests;
· Productionize machine learning models using proprietary infrastructure and AWS.

Rice University

Postdoctoral researcher   2020/09 - 2021/09
· Research resampling methods for model-free dependence test between time series;
· Analyzed large-sample properties for asymptotic exactness and high statistical power.

Education

The University of Chicago   2015/09 - 2020/08
Ph.D. candidate, Statistics
Advisor: Professor Per A. Mykland
Thesis: "High-frequency functional inference of dynamic data in time and frequency domains"

Nankai University   2009/09 - 2013/06
B.S., Mathematics; B.A., Economics

Papers

"Sound and Fury": Nonlinear Functionals of Volatility Matrix in the Presence of Jump and Noise.
Richard Y. Chen. 2024. *arXiv:2404.00606*

The Fourier transform method for volatility functional inference by asynchronous observations.
Richard Y. Chen. 2019. *arXiv:1911.02205*

Inference for volatility functionals of multivariate Itô semimartingales observed with jump and noise.
Richard Y. Chen. 2018. *arXiv:1810.04725*

Publication

Model-free approaches to discern non-stationary microstructure noise and time-varying liquidity in high-frequency data.

Richard Y. Chen, Per A. Mykland. *Journal of Econometrics (200) 2017, 79-103.*

Work in Progress

Volatility functionals of Itô semimartingales: microstructure noise and time-domain adaptive estimation.
Richard Y. Chen. 2020

Reassessment of long-range dependence of volatility by the estimation of volatility spectrum using high-frequency data.
Richard Y. Chen. 2020

Softwares

`PCA4TAQ`: a pipeline of query, cleaning, principal component analysis of big data
`SpecHFE`: nonparametric time-domain and spectral methods for high-frequency data
`ScalaMLE`: fast computation for Gaussian processes likelihood by stochastic approximation

Teaching

Teaching assistant for college classes
Introduction to mathematical probability (advanced course, 90 students, 2020 spring)
Introduction to probability models (advanced course, 33 students, 2020 winter)
Applied linear regression (introductory course, c. 160 students, 2016 spring, 2017 spring)
Statistical theory and methods (advanced course, 36 students, 2015 autumn)

Teaching assistant for professional graduate classes
Stochastic calculus, MSFM (c. 100 students, 2018 winter, 2019 winter)
Business statistics, MBA (96 students, 2016 spring)

Teaching assistant for Ph.D. core classes
Mathematical statistics (Bayes, high-dimensional statistics, 2019 spring)
Mathematical statistics (MLE, hypothesis testing, 2017 winter)

Volunteer tutor for statistics in the UChicago College Core Tutor Program   2015

Research Presentations

Stevanovich Center Seminar, The University of Chicago	2019/12
Joint Statistical Meeting, Denver	2019/07
SoFiE annual conference, Fudan University	2019/06
Argonne National Laboratory summer student workshop	2017/08
SoFiE summer school, Kellogg School of Business, Northwestern University	2017/07
SoFiE annual conference, Stern School of Business, New York University	2017/06
Market Microstructure and High Frequency Data, the University of Chicago	2017/06
SMSA workshop, Humboldt-Universität zu Berlin	2017/02
Statistical seminar, Department of ISOM, HKUST	2016/02
Statistics graduate student pizza talks	2016/01, 2017/02, 2018/11

Fellowship & Awards

The Stevanovich Fellowship, The Univesity of Chicago   2019

Travel awards, The Society for Financial Econometrics	2017, 2019
Annual scholarship for academic distinction	2010, 2011, 2012
Gold medal, Shiing-Shen Chern Mathematics Contest	2010

Services

Mentor for Amazon Machine Learning Research Intern	2023

Referee for *Journal of the American Statistical Association*	2019 - 2021
Referee for *Stochastics*	2020
Referee for *Sankhya A*	2020
Referee for *Journal of Econometrics*	2017 - 2020
Referee for *Management Science*	2020

Computational research aide, Argonne National Laboratory, MCS   2017
    Efficient computation of Gaussian process likelihood, ozone data

Statistical consulting for UChicago faculty and graduate students   2016, 2017
    Astrophysics: Gaussian processes for gravitational wave simulation
    Psychology: mixed effect models for moral judgement experimental data

Organizing committee for department faculty-student lunch   2016

Intern, IBM Watson Analytics, statistics team, Chicago   2015
    Generalized linear models for zero-inflated count data
    Multivariate time series forecasting under multiple hierarchy structures

updated in 2024/04