

RAJVEER JAT

Department of Economics, University of California, Riverside

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CONTACT INFORMATION

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EDUCATION

University of California (UC), Riverside	PhD in Economics	<i>Expected: June '25</i>
<i>Committee:</i> Prof. Tae-Hwy Lee (Co-Chair), Prof. Aman Ullah (Co-Chair), Prof. Shujia Ma		
Indian Statistical Institute (ISI), Delhi	<i>MS in Quantitative Economics</i>	<i>May '19</i>
Indian Institute of Technology (IIT), Roorkee	B. Tech. in <i>Electrical Engineering</i>	<i>May '16</i>

REFERENCES

Prof. Tae-Hwy Lee , UC Riverside	talee@ucr.edu	<i>(951) 827-1509</i>
Prof. Marcelle Chauvet , UC Riverside	chauvet@ucr.edu	<i>(951) 827-1587</i>
Prof. Ruoyao Shi , UC Riverside	ruoyao.shi@ucr.edu	<i>(951) 827-1494</i>

FIELDS OF INTEREST

Causal Inference, Econometric Theory, High-Dimensional Econometrics, Machine Learning, Forecasting.

FELLOWSHIPS, HONORS, AND AWARDS

- Conference Travel Grant Award, Graduate Division, University of California, Riverside	2024, 2022
- Dean's Distinguished Fellowship, University of California Riverside	2020
- Teaching Fellowship, Ashoka University, India	2019
- Graduate Fellowship at Indian Statistical Institute	2018, 2019
- Book Prize Award for Exceptional Academic Performance, Indian Statistical Institute	2018, 2019
- Merit-cum-Means Scholarship, Indian Institute of Technology, Roorkee	2013, 2014, 2015, 2016

JOB MARKET PAPER

Sufficient Instrument Filter for Causal Discovery *[Draft]*

Abstract: We introduce a novel procedure to filter sufficient information from many instruments for the estimation of parameters in regression models with endogenous regressors. Our method remains robust when the number of instruments exceeds the sample size, and performs well with invalid observed instruments, as long as the unobserved common factors among the observed instruments are valid. Our method generalizes existing approaches by offering three key advantages: the ability to incorporate supervision, the flexibility to accommodate non-linearity, and the capacity for sufficient dimension reduction. Through extensive simulations, we demonstrate that our method consistently achieves lower bias and root mean squared error compared to competing methods, across many specifications. We further validate our approach with two real-world applications, yielding meaningful insights into causal relationships.

PUBLICATION IN PROGRESS

Kernel Three Pass Regression Filter with *Daanish Padha*

Submitted

-Accepted at The 2024 California Econometrics Conference.

-Accepted at The 34th Annual Midwest Econometrics Group Conference.

Abstract: We forecast a single time series using a high-dimensional set of predictors. When predictors share common underlying dynamics, a latent factor model estimated by the Principal Component method effectively characterizes their co-movements. These latent factors succinctly summarize the data and aid in prediction, mitigating the curse of dimensionality. However, two significant drawbacks arise: (1) not all factors may be relevant, and utilizing all of them in constructing forecasts leads to inefficiency, and (2) typical models assume a linear dependence of the target on the set of predictors, which limits accuracy. We address these issues through a novel method: Kernel Three-Pass Regression Filter. This method extends a supervised forecasting technique, the Three-Pass Regression Filter, to exclude irrelevant information and operate within an enhanced framework capable of handling nonlinear dependencies. Our computationally efficient method demonstrates strong empirical performance, particularly over longer forecast horizons.

RESEARCH IN PROGRESS

Supervising Deep Dynamic Factor Models for Forecasting with *Daanish Padha* [Work in Progress]

Abstract: We forecast a single time series using a high-dimensional set of predictors. When these predictors share common underlying dynamics, an approximate latent factor model provides a powerful characterization of their co-movements. These latent factors succinctly summarize the data and can also be used for prediction, alleviating the curse of dimensionality in high-dimensional prediction exercises. However, forecasting using these latent factors suffers from two potential drawbacks. First, not all-pervasive factors among the set of predictors may be relevant, and using all of them can lead to inefficient forecasts. The second shortcoming is the assumption of linear dependence of predictors on the underlying factors. The first issue can be addressed by using some form of supervision, which leads to omitting irrelevant information. The second issue can be alleviated by allowing non-linear dependence of predictors on factors. We use supervised deep dynamic factor models to learn the non-linear latent factor structure in the data. We compare the forecasting performance of our method against the competing approaches in the literature.

Information Theoretic Maximum Entropy Density Estimator

[Work in Progress]

-Developing a new distribution learning method for better faster non-parametric estimations.

TEACHING

Lead, Graduate Quantitative Methods Center, UC Riverside

- Basic Quantitative Methods for Finance (for MBA, Masters in Finance, MS in Financial Analytics) Fall 2024
- High-dimensional Statistics: Making Sense of Big Data (for PhDs and MS students) Fall 2024
- Non-parametric Regressions: Inferences and Implementation in R (for PhDs and MS students) Winter 2025
- Macroeconomics and Time Series Econometrics (for Grad students) Winter 2025
- Causal Inference Techniques (for Grad students) Winter 2025

Instructor, Dept. of Economics, UC Riverside

- Economic Development: Theory and Policy (Applications in Python, [Syllabus]) Summer 2024 [Reviews]
- Environmental Economics with Applications in R. ([Syllabus]) Summer 2023 [Reviews]

Teaching Assistant, Dept. of Economics, UC Riverside

- Econometric Theory III (Graduate level, [Syllabus]) Spring 2024 [Reviews]
- Statistics for Economics Fall 2022 [Reviews], Winter 2024 [Reviews]
- Stock Market Fall 2021 [Reviews], Spring 2023 [Reviews], Fall 2023 [Reviews]
- Intermediate Microeconomics Summer 2022 [Reviews]
- Introductory Econometrics I Winter 2023 [Reviews]
- Introduction to Macroeconomics Winter 2022 [Reviews]

PROFESSIONAL EXPERIENCE

Lead, GradQuant, University of California Riverside	Jul'24 - Present
-Leading the center for quantitative methods for grad students and post-doc researchers at UC Riverside.	
Quant Consultant, Research Triangle Institute (RTI) International	Jul'21 - Sep'21
- Developed statistical models for future cash flow streams to help \$10 million investment decision problem.	
Quant Research Intern, KPMG	Jan'20 - Aug'20
-Solved an expected revenue estimation problem using a constrained optimization framework in Python.	
Quant Consultant, Asian Infrastructure Investment Bank (AIIB)	Nov'19 to May'21
-Developed mathematical models to guide the statistical pursuit of optimal solutions to investment problems.	
C++ Software Engineer, HCL Technologies India	Oct'16-Jul'17

PRESENTATIONS IN RESEARCH CONFERENCES

2024: The 34 th Annual Midwest Econometrics Group Conference at University of Kentucky	Lexington, KY
2024: The 2024 California Econometric Conference at UC Davis	Davis, CA
2023: Fall 2023 Econometrics Seminar at UC Riverside	Riverside, CA
2023: Spring 2023 Brown Bag Seminar at UC Riverside	Riverside, CA
2023: Winter 2023 Brown Bag Seminar at UC Riverside	Riverside, CA
2022: Annual Conference by The Econometric Society & Delhi School of Economics	Delhi, India
2019: Annual Conference by the Indian Statistical Institute	Delhi, India

VOLUNTEER/LEADERSHIP POSITIONS

Lead Consultant at Graduate Quantitative Methods Center at UC Riverside	2024-2025
Student Volunteer at All California Labor Economics Conference	2022
General Secretary (Finance), Student Government Body, IIT Roorkee	2014-2015
Class Representative of 2012-2016 Batch of Electrical Engineering, IIT Roorkee	2012-2015