Yi He

Contact Information

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Research Interests

High Dimensional Statistics for Non-sparse Models, Large Dimensional Time Series, Random-Matrix-Theory based Statistical Inference, Statistical Learning for Heterogeneous Data, Network Science, Bootstrapping, Neural Network Regression, Extreme Value Statistics, Set Inference, Empirical Likelihood, Empirical Process Theory, Financial Econometrics, Risk Management.

Position

University of Amsterdam, Quantitative Economics Section, The Netherlands
Associate Professor September 2022 – Present [School Interview Here]
Assistant Professor (Senior level), September 2019 – August 2022

Monash University, Department of Econometrics and Business Statistics, Australia
Adjunct Research Fellow, September 2019 – September 2022
Tenured Lecturer (Assistant Professor), September 2016 – August 2019

Education

Tilburg University

Ph.D. at Department of Econometrics and Operations Research, 2013 - 2016

- Dissertation Title: Multivariate Extreme Value Statistics for Risk Assessment
- Promotors: Prof. John H.J. Einmahl and Prof. Bas J.M. Werker
- Other Committee Members: Prof. Laurens de Haan, Prof. Davy Paindaveine, Dr. Pavel Cizek, and Prof. Chen Zhou

University of Cambridge

M.Phil., Finance (Financial Engineering), 2012-2013

- Jointly taught by staff of the Faculty of Mathematics, the Faculty of Economics and Cambridge Judge Business School
- Advanced courses in Statistical Theory, Stochastic Analysis, Mathematical Finance, Time Series, Cross-sectional and Panel Data Econometrics, Operations Research and Corporate Finance

Tilburg University

B.Sc., Econometrics and Operations Research, *cum laude*, 2009-2012

- Top ranking with average grade 9.33 out of 10
- Netspar Award Winning Thesis: Estimation of Premiums for Heavy-Tailed Loss

Honors and Awards

"Teacher of The Year" for MSc Econometrics Programme at University of Amsterdam, 2022

Tinbergen Institute Research Fellow, 2021–Present

Netspar Thesis Award, Netherlands, 2013

Tilburg University Excellence Scholarship, Netherlands, 2012

Huygens Scholarship (National Award) by Dutch Ministry of Education, Culture, and Science, Netherlands, 2011

First Prize, National High School Mathematics Competition, China, 2006

First Prize, National Middle School Mathematics Competition, China, 2003

Grant

2020 A Sustainable Future (ASF) Research Grant, The Netherlands
- Primary Chief Investigator
- Project title: Forecasting climate extremes with deep learning

2018 Early Career Researcher Grant by Monash Business School, Australia
- Primary Chief Investigator
- Project title: Optimal forecasts in large dimensional business and economic models.

Publications

Yi He (2023+), "Ridge Prediction under Dense Factor Augmented Models". Published Online at *Journal of the American Statistical Association*.

John H.J. Einmahl, and Yi He (2023), "Extreme Value Inference for Heterogeneous Power Law Data". *The Annals of Statistics*, 51, 1331–1356.

Yi He, Jiti Gao, and Sombut Jaidee (2023), "Most Powerful Test against a Sequence of High Dimensional Local Alternatives". *Journal of Econometrics*, 234, 151–177.

John H.J. Einmahl, and Yi He (2023), "Unified Extreme Value Estimation for Heterogeneous Data". *Journal of Business & Economic Statistics*, 41, 255–269.

Yi He, Liang Peng, Dabao Zhang and Zifeng Zhao (2022), "Risk Analysis via Generalized Pareto Distributions". *Journal of Business & Economic Statistics*, 40, 852–867. [This paper is listed among the most read article (all time) at JBES]

Yi He, Yanxi Hou, Liang Peng and Haipeng Shen (2020), "Inference for Conditional Value-at-Risk of a Predictive Regression". *The Annals of Statistics*, 48, 3442–3464.

Yi He, Yanxi Hou, Liang Peng and Jiliang Sheng (2019), " Statistical Inference for a Relative Risk Measure". *Journal of Business & Economic Statistics*, 37, 301-311.

Yi He and John H.J. Einmahl (2017), "Estimation of Extreme Depth-based Quantile Regions", *Journal of the Royal Statistical Society - Series B*, 79, 449-461.

Working Papers

Yi He and Bo Zhang, "Detecting Spurious Factor Models".

Yi He and Tiandong Wang, "Detecting Communities in Latent Networks"

John H.J. Einmahl, and Yi He, "Extending Extreme Value Inference to General Heterogeneous Data".

Yi He and Jiti Gao, 'Testing Against High-Dimensional Alternatives with Heteroskedasticity".

Yi He, Liang Peng, Dabao Zhang and Zifeng Zhao, "A Modified Kaplan-Meier Estimator and Its Application".

John H.J. Einmahl, and Yi He, "Ultimate Athlete Records Are More Accurate Than You Think".

Works in Progress

Hao Li, Tiandong Wang and Yi He, "*P*-hacking and Network Centrality".

Yi He, Lina Zhang, and Xueyan Zhao, "Improving Testing Power for Instrumental Variables Regression: A Semi-supervised Learning Approach"

Yi He and Juan-Juan Cai, "Semiparametric Regression Using Deep Neural Networks".

Yi He and Lingwei Kong, “Taming the Factor Zoo Using Stability Selection”.

Referee

The Annals of Statistics, Biometrika, Journal of the American Statistical Association, Journal of Econometrics, Journal of Business & Economic Statistics, Management Science, Journal of Nonparametric Statistics, Journal of Financial Econometrics, Extremes, Journal of Multivariate Analysis, Electronic Journal of Statistics, Econometrics and Statistics, International Journal of Forecasting, and Computational Economics.

PhD Students

Ming Cheng, 2023–2026, co-supervision with Prof. Peter Boswijk.

Sombut Jaidee, 2018–2022, co-supervision with Prof. Jiti Gao.

(Postdoc at Nanyang Technological University under Supervision of Professor Guangming Pan)

Current Teaching

University of Amsterdam, Amsterdam, The Netherlands

Lecturer, tutor and chief examiner **Jan 2020–Present**
Course: Statistical Learning

- Theory: Bias variance tradeoff and cross validation, high dimensional linear regression, classification, nonlinear models, tree-based methods
- R programming: cross validation, linear regression, subset selection methods, Ridge and LASSO regression, principal components regression, logistic regression, linear and quadratic discriminant analysis, spline regression, fitting classification and regression trees, and random forest.
- Python programming from 2024.
- Around 200 second/third year econometrics Bachelor students in the years 2021–2023
- 70+ third year econometrics Bachelor students in the year 2020

Lecturer, tutor and chief examiner **Oct 2020–Present**
Course: Machine Learning for Econometrics

- Neural networks, deep learning, text analytics, boosting, bagging, random forest, causal inference with machine learning (double selection and debiased ML)
- Online reader `https://machinelearningtheory.org/`
- 120+ Master Econometrics Students (Data Science Track)
- “Teacher of the Year” for MSc Econometrics in 2022.
- Software: Python

Coordinator, lecturer and examiner **Feb 2022– Present**
Course: Reinforcement Learning

- Multi-armed bandits and algorithms, finite Markov Decision processes, dynamic programming, temporal-difference learning, N-step bootstrapping, planning and learning with tabular methods, Bellman equations, exact and approximate solutions, multi-agent models, games.
- 120+ Bachelor Econometrics and Data Science Students
- Software: Python

Lecturer, tutor and chief examiner **Oct 2022–Present**
Course: Machine Learning and Optimisation

- Support vector machine, neural networks, deep learning, stochastic gradient descent, boosting, column generation, margin maximization, bagging, random forest, optimal decision trees, mixed-integer optimisation,
- Collaboration with Prof. Ilker Birbil at Amsterdam Business School
- Online reader `https://machinelearningtheory.org/`
- Master Data Science and Business Analytics

- Software: Python

Tinbergen Institute, Amsterdam, The Netherlands

Lecturer and examiner **Jan 2023–Present**
Course: Advanced Time Series Econometrics

- Part II: High-dimensional volatility models, high-frequency financial econometrics, financial forecasting using machine learning methods
- Elective Course for Research Master Students

Past Teaching

Tutor **Oct 2019– Dec 2020**
Course: Data Preprocessing

- Second/Third year Econometrics Bachelor students
- Tutorial and computer classes

Lecturer **Oct–Dec 2019**
Courses: Data Stewardship (MBA)

- Data mining methods and Python programming
- Approximately 30 students

Monash University, Caulfield East, Victoria, Australia

Lecturer (Chief Examiner) **Jan 2017 – August 2019**
Courses: ETF2700 (UG)/ ETF5970 (PG) Mathematics for Business

- Calculus, Linear Algebra, Optimization, Financial Mathematics.
- Approximately 170 students in year 2017 and 400 students in year 2018.

Lecturer (Chief Examiner) **Jan 2019 – August 2019**
Courses: ETC3430 (UG) Financial Mathematics under Uncertainty

- Present values and accumulated values, Equations of value, Markov modelling, Survival models, Life tables, Contingent products.

Tilburg University, Tilburg, Netherlands

Teaching Assistant **Summer 2013 - June 2016**
Courses: Quantitative Methods (research master), Risk Theory (undergraduate), Introduction Finance and Actuarial Science (undergraduate), Statistics 1 for IBA (undergraduate).

Teaching Assistant **Spring 2012**
Undergraduate Courses: Differentiation and Integration Theory, Introduction Finance.

Academic Visits

Tilburg University, Tilburg, Netherlands

Department Econometrics and Operations Research **December 2017**
Hosted by Prof. John Einmahl.

Université Libre de Bruxelles, Brussels, Belgium

ECARES **July 2017**
Hosted by Prof. Davy Paindaveine.

Chalmers University of Technology, Gothenburg, Sweden

Department of Mathematical Science **December 2016**
Hosted by Prof. Holger Rootzén.

Georgia State University, J. Mack Robinson College of Business, Atlanta, Georgia USA

Department of Risk Management and Insurance **June 2015**

Hosted by Prof. Liang Peng.

Conference and Seminar Presentations

2023 Econometrics Seminar, University of Groningen

2023 Economics Seminar, Chinese University of Hong Kong

2023 Brown Bag Seminar, University of Amsterdam

2023 Invited Speaker at 13th International Conference on Extreme Value Analysis, Bocconi University, Milan, Italy.

2023 Invited Speaker at EVTA Seminar, Vrije Universiteit Amsterdam, the Netherlands

2022 15th International Conference of the ERCIM WG on Computational and Methodological Statistics (Session organizer), London, United Kingdom

2022 Extreme Value Theory and Quantitative Risk Management Workshop, Fudan University

2022 Tinbergen Institute Econometrics Seminar

2021 Invited Webinar at International Institute of Finance, University of Science and Technology of China, China.

2021 Young Researchers Workshop on Quantitative Risk Management and Other Related Topics, Fudan University, Shanghai, China.

2021 Invited Webinar at Research School of Finance, Actuarial Studies and Statistics, Australian National University, Australia.

2021 Invited Webinar at Department of Mathematics, University of York, United Kingdom.

2021 Invited Webinar at School of Economics, Xiamen University, China.

2020 13th International Conference of the ERCIM WG on Computational and Methodological Statistics (Session organizer), London, United Kingdom

2020 Netherlands Econometric Study Group Conference (virtual), Tilburg, Netherlands

2019 12th International Conference of the ERCIM WG on Computational and Methodological Statistics (Session organizer), London, United Kingdom

2019 Extreme TiDE Seminar 2019, Delft University of Technology, Netherlands

2019 11th International Conference on Extreme Value Analysis (Invited), Zagreb, Croatia

2018 11th International Conference of the ERCIM WG on Computational and Methodological Statistics (Invited), Pisa, Italy

2018 Actuarial Risk Modelling and Extreme Values (ARMEV) Workshop, Canberra, Australia

2018 14th International Symposium on Econometric Theory and Applications, Sydney, Australia

2017 3rd Xiamen-Monash Joint Workshop on Economics, Econometrics and Statistics, Xiamen, China

2017 10th International Conference of the ERCIM WG on Computational and Methodological Statistics (Invited), London, United Kingdom

2017 10th International Conference on Extreme Value Analysis, Delft, Netherlands

2016 9th International Conference of the ERCIM WG on Computational and Methodological Statistics (Invited), Seville, Spain

2016 Invited Seminar at Department of Mathematical Science, Chalmers University of Technology, Gothenburg, Sweden.

2016 3rd Conference of the International Society for Non-Parametric Statistics (Invited), Avignon, France

2015 8th International Conference of the ERCIM WG on Computational and Methodological Statistics (Invited), London, United Kingdom

2015 9th Extreme Value Analysis Conference, Ann Arbor, United States

2015 Econometrics & Statistics Seminar (Tilburg University), Tilburg, Netherlands

2014 AIO 22nd meeting of AIO's in Stochastics, Hilversum, Netherlands

2014 Econometrics Brown Bag Seminar (Tilburg University), Tilburg, Netherlands

COMPUTER SKILLS Python, R, MATLAB, Stata, C++, LaTeX, MS Office.

LANGUAGE SKILLS English (fluent), Mandarin Chinese (native), Cantonese (native) and Dutch (learning)

LINKEDIN RECOMMENDATIONS https://www.linkedin.com/in/yi-he-839b5b39

REFERENCES AVAILABLE TO CONTACT

Prof. John H.J. Einmahl (e-mail: j.h.j.einmahl@tilburguniversity.edu; phone: +31 13 466 8208)
Professor of Statistics, Tilburg University

Prof. Liang Peng (e-mail: lpeng@gsu.edu; phone: +1 404 413 7489)
Thomas P Bowles Chair Professor of Actuarial Science, Georgia State University

Prof. Jiti Gao (e-mail: Jiti.Gao@monash.edu; phone: +61 3 990 31675)
Professor & Donald Cochrane Chair BusEco, Monash University

More references available upon request.

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