

Ali Habibnia

Virginia Tech

Department of Economics
3016 Pamplin Hall, 880 West Campus Drive
Blacksburg, V.A. 24061 U.S.A.

habibnia@vt.edu

<http://www.alihabibnia.com>

[GitHub](#) | [Google Scholar](#) | [ORCID](#)

Education

- 2017** PH.D. in Statistics, **London School of Economics and Political Science**
- 2012** M.S. in Quantitative Finance, **Bayes Business School (formerly Cass Business School)**
- 2010** M.S. in Economics, **University of Tehran**
- 2007** B.S. in Economics, **University of Tehran**

Areas of Research Interest

Big Data Econometrics • Machine Learning & Causal Machine Learning • Nonlinear Time Series
Quantum Computing for Finance • Financial Econometrics • Financial Networks and Systemic Risk

Current Appointments

- 2024–** Founding Director, Dataism Laboratory for Quantitative Finance (DLQF), Virginia Tech
- 2018–** Assistant Professor, Department of Economics, Virginia Tech
- 2018–** Affiliated Faculty, Computational Modeling and Data Analytics, College of Science, Virginia Tech
- 2022–** Affiliated Faculty, Kellogg Center for Philosophy, Politics, and Economics, Virginia Tech
- 2021–** Associate Faculty, Machine Learning Program, Indian Institute of Technology Kharagpur
- 2020–** Associate Faculty, Deep Learning Program, NMIMS University

Past Appointments

- 2016–2018** Scientific Chair of Big Data Economics, Tehran Institute of Advanced Studies (TeIAS), Iran
- 2015–2018** Founding Board Member, Tehran Institute of Advanced Studies (TeIAS), Iran
- 2012–2017** Research Fellow, London School of Economics, UK
LSE Systemic Risk Centre; Time Series & Statistical Learning Group
- 2013** Quantitative Research Analyst, Pantheon Ventures LLP, UK
- 2011–2012** Student Experience Committee Member, MSc Quantitative Finance, City University London
- 2009–2011** Head of Equity Market & Research Department, Rahbord Investment Company, Iran
- 2009–2010** Derivatives Trading Strategist, Wise Enterprises FZCO, Dubai, UAE
- 2009–2010** Stock Market Analyst Intern, Nikan Capital, Iran

Grants, Fellowships & Awards

- 2024** Finalist (Top 5), ADIA Lab Best Paper Award, “Modeling Systemic Risk: A Time-Varying Nonparametric Causal Inference Framework”
- 2023** Outstanding Faculty in Undergraduate Teaching, Department of Economics, Virginia Tech
- 2022** Kellogg Center PPE Research Fellowship, “The History and New Trends of Measuring Dependence: From Bayes, Galton, and Pearson to the 21st Century”
- 2021** Lay Nam Chang Dean’s Discovery Fund Grant, “Deep Learning for Nonlinear Common-Factor Modeling and Forecasting in Economics” (with Russell J. Hewett and Dawson Miller, Virginia Tech)
- 2015** Highly Commended Research Prize, LSE Research Festival
- 2014–2017** Doctoral Fellowship, ESRC and LSE Systemic Risk Centre
- 2012–2017** Ph.D. Scholarship, LSE Department of Statistics
- 2010** Recognized as a Scientific Elite, Iran National Elites Foundation
- 2007** Exceptional Talent Recognition, National Organization for Development of Exceptional Talents

Publications

PEER-REVIEWED JOURNAL ARTICLES

- 2026 Li, Q., Mukhopadhyay, C., Bayat, A., & Habibnia, A. “Quantum Reservoir Computing for Realized Volatility Forecasting.” *Physical Review Research (American Physical Society)*, 8, XXXXX (2026).
- 2025 Habibnia, A., & Golshani Nasab, P. “Trading on Emotion: Behavioral and Predictive Determinants of Algorithmic Trading Adoption.” *Journal of Behavioral Finance*, 1–14. Special Issue on Statistical and Machine Learning for Investor Modelling.
- 2025 Ardalankia, J., Habibnia, A., Ausloos, M., & Jafari, G. R. “Hidden Community Interlayer Spillover Detection in Financial Multilayer Networks: Generalization of Hierarchical Clustering to Multi-layer Networks.” *PLOS ONE*, 20(9), e0330372.
- 2024 Saffar, M., Kalhor, A., & Habibnia, A. “A Geometric Approach for Accelerating Neural Networks Designed for Classification Problems.” *Scientific Reports (Nature Portfolio)*, 14(1), 17590.
- 2021 Habibnia, A., & Maasoumi, E. “Forecasting in Big Data Environments: An Adaptable and Automated Shrinkage Estimation of Neural Networks (AAShNet).” *Journal of Quantitative Economics*, 19, 363–381. The Special Issue in Honor of Anirudh Lal Nagar.
- 2011 Haeri, A., Rabbani, M., & Habibnia, A. “Mathematical Models for Decision-Making and Forecasting in the Euro–Yen Foreign Exchange Market.” *Iranian Economic Review*, 16(30), 67–91.

ARTICLES UNDER REVIEW OR REVISION

- Habibnia, A., & Shah, G. “Causal Effects of Financial Deregulation on Bank Risk: Insights from Double Machine Learning with Panel Data” Under review at *Journal of Applied Econometrics*.
- Gendron, J., & Habibnia, A. “Evaluating Meta-Regression Techniques: A Simulation Study on Heterogeneity in Location and Time.” Under review at *Journal of Economic Surveys*.
- Etesami, J., Habibnia, A., & Kiyavash, N. “Systemic Risk and Cryptocurrency Spillovers: Time-Varying Directed Information Graphs.” Under review at *Journal of Financial Stability*.
- Chao, Y., Etesami, J., & Habibnia, A. “Learning Nonlinear Factor Models with Unknown Monotone Links from Incomplete and Noisy Data.” Under review, *International Conference on Machine Learning (ICML)*.
- Amini, A. A., Habibnia, A., & Sadeghi, H. “Online Detection of Change in Correlation for Dynamic Asset Allocation.” Under review at *Review of Financial Studies*.
- Kooshki, A., & Habibnia, A. “Dynamic Analysis of Systemic Risk in the Banking Sector Through Transfer Entropy and Temporal Measures.” Under review at *Risks*.
- Habibnia, A., & Soltanzadeh, M. “Optimizing Portfolio with Two-Sided Transactions and Lending: A Reinforcement Learning Framework.” Under review at *Journal of Portfolio Management Research*.

CONFERENCE PROCEEDINGS

- 2024 Bandalinaeini, H., Salavati, E., Sharifkhani, M., & Habibnia, A. “A Cross-Stock Deep Learning Model for Mid-Price Prediction.” In *Proceedings of the 5th ACM International Conference on AI in Finance*. ACM.
- 2018 Etesami, J., Habibnia, A., & Kiyavash, N. “Econometric Modeling of Systemic Risk: A Time Series Approach.” In *Proceedings of MiLeTS '18*. London, UK. ACM.
- 2013 Habibnia, A. “Foreign Exchange Rate Risk Measurement and Management.” In *Proceedings of the 5th Conference on Development of Financing System*. Tehran, Iran.

BOOK CHAPTERS

- 2024 Razavi, H., & Habibnia, A. “The Rise of AI in Middle Eastern Fintech: Case Studies from the UAE and Turkey.” In *Exploring Global FinTech Advancement and Applications*. IGI Global.

WORKING PAPERS

“Rethinking Dependence Measurement in Economics: Permutation-Based Inference for Correlation and Regression.” With Jonathan Gendron and Alex Jaimes Sandoval (Virginia Tech).

“Filling the Gaps in Meta-Regressions: Machine Learning in Realistic Heterogeneity Structures.” With Jonathan Gendron and Alex Jaimes Sandoval (Virginia Tech).

“Beyond Separability: A Study of Higher-Order Metrics on Latent Space.” With Apoorva Chavali (Virginia Tech).

“Reinforcement Learning for Optimal Buy-Side Order Execution: A Mixture-of-Experts Approach Using High-Frequency Limit Order Book Data.” With Alexander Ardia (Virginia Tech).

“A Multiplex Network Approach to Portfolio Selection.” With Jamshid Ardalankia (Virginia Tech).

“Do ESG Practices Matter in Decentralized Finance? Evidence from ICO Funding, Token Holders, and Post-Offering Performance” with Masoud Negahban-Azar (University of Maryland) Mohammad Hossein Jalali & Mohammad Jahanbakht (Sharif University of Technology).

“Blockchain-Based Supply Chain Finance: Conceptual Model with an Agent-Based Approach.” with Soheil Aeen & Mahdi Nouri (University of Tehran).

“AE-Prob(M): Uncertainty Quantification for Time Series via an Entropy-Based Autoencoder.” with Russell Hewett & Dawson Miller (Virginia Tech).

“Decomposition-Enhanced Deep Learning for Financial Forecasting.” with Kamran Pakizehb & Amir Soltanpourb (Kharazmi University).

“A Review of the Past, Present, and Future of Testing for Nonlinearity in Time Series.”

“Testing for Neglected Nonlinearity in High-Dimensional Time Series Models: A Deep Neural Network Approach.”

SOFTWARE

- 2023 Habibnia, A. “Algorithmic Trading with Python.” doi.org/10.5281/zenodo.18737793
- 2018 Habibnia, A., Rahimikia, E. “Nonlinearity Test for Principal Component Analysis.” MathWorks. doi.org/10.5281/zenodo.18737933
- 2017 Habibnia, A., Rahimikia, E. “MATLAB Tutorial for Data Science.” MathWorks. DOI: [10.13140/RG.2.2.16859.77607](https://doi.org/10.13140/RG.2.2.16859.77607)

THESIS

- 2017 “Essays in High-Dimensional Nonlinear Time Series Analysis.” Ph.D. thesis. Available at etheses.lse.ac.uk/3485.
- 2012 “Forecasting Volatility in Financial Markets! By Introducing a GA-Assisted SVR-GARCH Model.” Master’s thesis. Available at SSRN [2144922](https://ssrn.com/abstract=2144922).
- 2010 “Forecasting the World Gold Price Using Optimized Neuro-Fuzzy with Genetic Algorithm (GA-ANFIS) and Smooth Transition Regression with Long Memory (FI-STAR) Modelling.” Master’s thesis. Available at SSRN [2010545](https://ssrn.com/abstract=2010545).

Conference presentations & invited talks

- 2026 Causal Effects of Financial Deregulation on Bank Risk: Insights from Double Machine Learning with Panel Data, *Camp Econometrics XX*
- 2025 Policy Analysis of Reduced Regulatory Supervision on Bank Risk Using Double Machine Learning for Panel Data, *Southern Economic Association, 95th Annual Conference, Session on High-Dimensional Econometrics and Machine Learning*
- 2025 Realized Volatility Forecasting with Quantum Reservoir Learning, *Department of Economics Seminar, University of Kansas*

- 2024 Realized Volatility Forecasting with Quantum Reservoir Learning, *The 5th Annual DC-MD-VA Econometrics Workshop*
- 2023 A Time-varying Causal Inference Framework for Modeling Systemic Risk in High-Dimensional Financial Networks, *The 4th Annual DC-MD-VA Econometrics Workshop*
- 2023 The History and New Trends of Measuring Dependence, *Kellogg Center PPE Research Fellow Panel*
- 2023 Quantum Computing Solutions for Econometrics, *Physics of Quantum Information Technology (PQIT) Lab in China*
- 2023 Enhancing Economic Analysis and Policy-Making: The Synergy of AI, Big Data, and HPC, *Perspectives on the Human AI Event, ICAT, Virginia Tech*
- 2023 Topics in Advanced Financial Econometrics, *University of Tehran, Faculty of Economics*
- 2023 Algorithmic Trading and Intelligent Investment Strategies, *Kharazmi University*
- 2022 Quantum Computing & Quantum Machine Learning Solutions for Economics and Finance, *University of Electronic Science and Technology of China (UESTC)*
- 2021 Information Theory & Financial Network Analysis, *University of Tehran, Dept. of Economics*
- 2021 Shrinkage Estimation of Neural Networks, *41st International Symposium on Forecasting*
- 2020 Machine Learning for Econometricians, *North Carolina State University, Dept. of Economics*
- 2019 Adaptable and Automated Shrinkage Estimation of Neural Networks (AAShNet), *Stanford Institute for Theoretical Economics – Asset Pricing Theory and Computation Summer Workshop*
- 2019 Big Data and Machine Learning for Policymaking, *International Monetary Fund, SPR Department*
- 2018 Introduction and Overview of Applications of Artificial Intelligence and Machine Learning in Scientific Research, *Virginia Tech*
- 2018 Financial Time Series Analysis: Deep Learning Approach, *MathWorks Computational Finance*
- 2018 Text Mining & Sentiment Analysis in Trading, *Tehran Stock Exchange TSE*
- 2016 Machine Learning for Economic and Financial Forecasting, *The Technical Analyst*
- 2015 Nonlinear Forecasting with Many Predictors by Neural Network Factor Models (Poster), *LSE Research Festival, London School of Economics*
- 2015 Nonlinear Forecasting with Many Predictors by Neural Network Factor Models, *35th International Symposium on Forecasting (ISF), Riverside, California*
- 2014 Forecasting in Big Data Environments: Shrinkage Estimation of Neural Networks, *International Conference on Computational and Financial Econometrics (CFE-ERCIM), University of Pisa*
- 2013 Foreign Exchange Rate Risk Measurement and Management, *5th Conference on Development of Financing System, Tehran, Iran*
- 2012 Time Series Forecasting using Wavelet Kernel Support Vector Machine, *LSE*

Referee & Editorial Activity

Editorial Board: - Journal of Countries Studies (2023–),

Referee for: Journal of Business and Economic Statistics, Econometric Reviews, Econometrics, International Journal of Forecasting, Applied Economic Perspectives & Policy, Proceedings of the National Academy of Sciences (PNAS), Risks, Entropy, Economic Modelling, Journal of Economic Behavior and Organization, INFORMS Journal on Computing.

Teaching

VIRGINIA TECH (2019–)

(Adv) Big Data Economics (ECON 5314G - ECON 4314 - CMDA 4314)

Data Science for Quantitative Finance (ECON 4984 - CMDA 4984)

Machine Learning & Data Classifiers (C7 - Module for Program In Business Analytics)

NMIMS AND IIT KHARAGPUR (2020-)

Machine & Deep Learning from Theory to Practice (Module for M.Tech Data Science)

Neural Networks, Deep Learning, and Decision Trees (Program in Business Analytics and AI)

LONDON SCHOOL OF ECONOMICS (2012-2017)

Elementary Statistical Theory (ST102), Quantitative Methods (ST107), Time Series Forecasting (ST304), Applied Regression with R (ST211)
Factor Models in Time Series (Summer Programme)

UNIVERSITY OF TEHRAN (2008-2012)

Econometrics (graduate), Macroeconomics I & II (undergraduate), Machine Learning Applied to Finance (graduate)

OTHER INSTITUTES

2022 Big Data & Machine Learning for Causal Inference and Treatment Effects with Python, *TeIAS, Iran*
2018 Linear Algebra & Probability for Machine Learning in Python, *Tehran Stock Exchange*
2018 Time Series Forecasting with Python, *Tehran Stock Exchange*
2017 Algorithmic Trading with Python, *Tehran Stock Exchange*
2017 Deep Learning & Machine Learning Applied to Trading, *Tehran Stock Exchange*
2015 Econometrics of Monetary Policy (postgraduate), *Khatam University*
2013 Global Business Environment (MBA Course), *London Business School*
2008-2016 Technical Analysis of Financial Markets, *More than 20 times in various universities and institutes*

Supervision

VIRGINIA TECH (2019-)

Jonathan Gendron (PH.D. Committee Chair), Economics (then Assistant Professor at Xavier University)

Jamshid Ardalankia (PH.D. Committee Chair), Economics, Virginia Tech

Gaurav Shah (M.S. Advisor), Computer Science, Virginia Tech

Arin Shahbazyan (PH.D. Committee), Economics, Virginia Tech

Brian D'Orazio (PH.D. Committee), Economics, Virginia Tech

Mohammad Mahdi Banasaz (PH.D. Committee), Economics, Virginia Tech

Dawson Miller (M.S. Co-Advisor), Department of Mathematics, Virginia Tech

He Jiang (PH.D. Committee), Economics, Virginia Tech

Austin Bradley (PH.D. Committee), Economics, Virginia Tech

Nicole Raphael (Undergraduate Research), Economics, Virginia Tech

Max Brenner (Undergraduate Research), Economics, Virginia Tech

OTHER INSTITUTES

Farnam Shahba (PH.D. Advisor), Economics & Econometrics, University of Tehran

Soheil Aeen (PH.D. Co-Advisor), Economics & Econometrics, University of Tehran

Mohsen Saffar (PH.D. Co-Advisor 2023), Electrical and Computer Engineering, University of Tehran

Mahdi Bagheri (PH.D. Committee 2023), Electrical and Computer Engineering, University of Tehran

Mahsa Rajabi (PH.D. Committee 2017), Electrical Engineering, K.N.Toosi University of Technology

Raheleh Shahrokhi (PH.D. Committee 2017), Electrical Engineering, K.N.Toosi University

Mahdi Soltanzadeh (M.S. Advisor 2023), Financial Engineering, Khatam University

Emad Habibzadeh (M.S. Advisor 2016), Financial Engineering, Khatam University

Fatemeh Ghasempour (M.S. Advisor 2016), Risk Management, Khatam University

Programming and Software

Languages: Python, R, MATLAB, C, PHP, HTML.

Econometric Packages: EViews, G@RCH, OX Metrics, Stata, JMulTi.

Financial Packages: Bloomberg Terminal, Thinkorswim, Binance, AmiBroker, MetaTrader.

Last updated: March 26, 2026