

Curriculum Vitae – Fall 2024

Family name: Moslemihaghighi
Given name: Alireza
Gender: male
Date of birth: 07/01/1997
Citizenship: Iran
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Qualifications

- *PhD of Finance* August 2024- 2028 (Expected)
PhD in Finance & Economics, Bocconi University, Milan, Italy
- *MSc of Financial Economics* September 2021- February 2024
MSc in Theoretical Economics, Sharif University of Technology, Tehran, Iran
- *BSc of Electrical Engineering* September 2015- February 2020
BSc in Electrical Engineering, Sharif University of Technology, Tehran, Iran

Awards and Scholarships

- PhD Merit Fellowship (4 Years), Bocconi University, 2024
- Best Student Award, Economics Department, Sharif University of Technology, 2023
- Ranked 9th in the National University Entrance Exam, MSc Economics programs, 2021
- Ranked 16th in the National University Entrance Exam, MSc Computer Science programs, 2021
- Merit Monthly Scholarship (4 Years), National Elites Foundation, Iran, 2016
- Member of National Elites Foundation, National Elites Foundation, Iran, 2016
- Ranked 40th in the National University Entrance Exam, Bachelor degree programs, Among more than 150,000 participants, 2015
- 1st Place in the Khwarizmi Festival, Designing shoes for blind people, Fars, 2011
- Khalij Fars Robotic Competition Award, Bean planter, 2011

Research Interests

Asset Pricing – Financial Machine Learning – Derivatives – FinTech – MacroFinance – Causal Inference

Publications

- *A Flexible Approach to Interference Cancellation in Distributed Sensor Networks, IEEE Communications Letters*
- *Solutions Manual for High Dimensional Statistics- A Non-Asymptotic Viewpoint by Martin J. Wainwright, Unpublished Solution Manual*

Working papers

- ***Temporal Volatility Surface Projection- Parametric Surface Projection Method for Derivatives Portfolio Risk Management,***
Co-authors: S. Zamani, H. Arian

ABSTRACT

This study explores the complexities of risk evaluation in financial derivatives, particularly options. Unlike bonds, options face broader risks due to their non-linear price behavior relative to pricing parameters. Assessing their risk is more challenging than for fixed-income instruments like debt securities, with a key factor being the uncertainty from first-order fluctuations in the underlying asset's volatility. These fluctuations resemble interest rate risk in zero-coupon bonds but require greater attention due to their dependence on a wider range of variables and their temporal variability. The study focuses on risk assessment by using the implied volatility surface, rather than a single volatility estimate.

- **Introducing PCE 1.0 : A New Persian Corpus for Comprehensive Cause-Effect Analysis with Question-Answering Integration,**

Co-authors: M. Farahbakhsh, M. Fazli, E. Asgari

ABSTRACT

This research introduces PCE 1.0, a new Persian corpus designed to extract cause-and-effect relationships from text, advancing our understanding of causality in Persian-language content. Traditionally, cause-effect analysis relies on explicit markers such as conjunctions and verbs, but this research goes beyond those, demonstrating the model's ability to recognize unmarked causality. The approach expands the range of potential cause-effect phrases, uncovering new relationships. By integrating PCE 1.0 with Question-Answering techniques, the study offers a comprehensive analysis of cause-effect relationships in Persian texts, backed by empirical evaluations, making it a valuable resource for natural language processing and text analysis.

- **Distributed interference cancellation in multi-agent scenarios,**

Co-authors: M. Shamsi, F. Marvasti

ABSTRACT

This paper addresses the challenge of detecting impaired and noisy nodes in a network. In distributed algorithms, numerous processing units collaborate and communicate to achieve a shared global objective. Depending on their state within the environment, these units may either assist or hinder other nodes, the latter due to noise or deliberate interference. Previous research has primarily focused on assigning optimal agent positions and initial weights to minimize the impact of noisy nodes. In contrast, we propose an adaptive algorithm that dynamically adjusts sharing weights based on the observed behavior of agents. The effectiveness and generality of our approach are demonstrated by applying it to a multi-agent reinforcement learning (RL) scenario and the well-known diffusion LMS algorithm.

Work in Progress

- **Optimizing Stock Portfolios Using Trading Data of Senior Shareholders,**

Co-authors: M. Farahbakhsh, M. Fazli, E. Asgari

ABSTRACT

This study focuses on accessing and analyzing a unique dataset from the Tehran Stock Exchange (TSE), detailing years of financial transactions by senior shareholders and their portfolio optimization strategies. Although the data posed challenges due to its complexity and limited accessibility, careful cleaning and organization turned it into a valuable resource for financial research, particularly in portfolio optimization. The proposed method structures portfolios as a linear combination of those owned by major shareholders, essentially mimicking their trades. The effectiveness of this approach is evaluated by comparing its performance against benchmarks like the total stock market index.

Work Experience

- **Data Analyst Intern, FIDC** *July 2018- March 2020*
- **Research Assistant, TEIAS / Tehran Institute for Advanced Studies** *July 2019- August 2021*
Topic: High-Dimensional Statistics
- **Teaching Assistant, Sharif University of Technology** *September 2017- February 2018*
 - Analog Circuits, Dr. Faez
 - Numerical Analysis, Dr. Gholampour
 - Electrical Engineering Principles, Dr. Khavasi

Language Skills

- **English:** TOEFL iBT (Total 104) *October 2023*
Reading (30/30), Listening (26/30), Speaking (26/30), Writing (22/30)
- **Persian:** Native

IT Skills

Operating Systems: Windows (fairly good), Linux (basic).

Programming languages: Pascal (basic), C (fairly good), C++ (fairly good), Python (excellent), Julia (good), Delphi (basic).

Office softwares: Microsoft Office (good), LaTeX (fairly good).

Scientific softwares: Matlab (excellent).