Kosar Abdollahi

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Education

2022 - 2024 **M.Sc. in Mathematical Statistics**, University of Tehran (GPA: 4.0/4.0)
Thesis: *Causal Discovery in Longitudinal Data.*
Ranked 2nd in class; Offered Ph.D. program admission.

2018 - 2022 **B.Sc. in Statistics**, University of Tehran (GPA: 3.52/4.0; Last two years: 3.85/4.0)
Ranked 2nd in class; Direct admission to the Master's program.

Teaching Experience

- **Teaching Assistant** – Probability Theory — *University of Tehran*, *Feb 2024 - July 2024*

- **Teaching Assistant** – Design and Analysis of Experiments I & II — *University of Tehran*, *Sep 2022 - Jan 2023*, *Feb 2023 - July 2023*, *Sep 2023 - Jan 2024*, *Feb 2024 - July 2024*

- **Teaching Assistant** – Statistical Methods — *University of Tehran*, *Sep 2019 - Jan 2020*, *Sep 2023 - Jan 2024*

Responsible for conducting weekly classes covering both theoretical foundations and programming applications, emphasizing deep conceptual understanding and the origins of key methods. Managed homework assignments, grading, exam preparation, and supervised students on semester-long projects.

Research Experience

Research Assistant at University of Tehran *Sep 2024 - Present*
Under Prof. Zahra Rezaei Ghahroodi

- 1. Developed an extension of a causal discovery framework to address challenges in multiscale longitudinal clinical data, including time-evolving processes, population heterogeneity, and latent confounding.
  2. Applied the framework to COVID-19 patient data, uncovering clinically meaningful causal pathways and distinguishing genuine effects from confounded associations.
- Currently working on leveraging causal knowledge to enhance deep learning models for longitudinal clinical data.

Research Intern at Statistical Center of Iran *Feb 2022 - June 2022*
Research and Development Division

Contributed to the development and refinement of a national questionnaire for data collection, with a focus on methodological design and evaluation, and assisted in preparing the framework for subsequent data analysis.

Publications and Presentations

- **Journal Paper** *(under review)*
  K. Abdollahi, Z. Rezaei Ghahroodi, M Mansourian; **Causal Discovery and Inference in COVID-19: A Multiscale Longitudinal Analysis Using Mixtures of DAGs.**
- **Conference Paper and Talk**
  K. Abdollahi, Z. Rezaei Ghahroodi (2024) **An Introduction to a Novel Causal Discovery Algorithm** *The 17th Iranian Statistics Conference, University of Birjand.*

  Presented a talk on causal discovery frameworks and their standard assumptions, highlighting the motivation and structure of the proposed algorithm, and demonstrated its workflow through a simulation study.

Selected Courses

Master's Courses

- Mathematical Analysis and Measure Theory
- Statistical Inference
- Probability Theory I
- Statistical Machine Learning
- Inference and Analysis of Longitudinal Data

Bachelor's Courses

- Mathematical Statistics I & II
- Stochastic Processes
- Discrete Multivariate Methods
- Continuous Multivariate Methods
- Non-parametric Statistical Methods
- Time Series

Courses from Math & CS:

- Fundamentals of Combinatorics
- Mathematical Analysis
- Linear & Non-Linear Optimization
- Advanced Linear Algebra

Additional Courses

- Probability Theory II (Ph.D. course, exceptionally allowed for a Master's student by Faculty Council)
- Philosophy of Mathematics (non-degree course), School of Mathematics, Institute for Research in Fundamental Sciences, Tehran, Iran

Skills

- **Languages:** Farsi (Native), Azerbaijani Turkish (Native), English (Fluent), French (Basic+)
- **Programming & Tools:** Experienced in R, Python, LaTeX; familiar with SAS, SQL