Machine Learning Department
Carnegie Mellon University
(+1) (608) 572 8519
bvarici@andrew.cmu.edu
Website

BURAK VARICI

Current Position

07.2024 – present **Carnegie Mellon University, Machine Learning Department**, Pittsburgh, PA.
- Postdoctoral Research Associate
- Supervisor: Prof. Pradeep Ravikumar

Education

08.2020– 05.2024 **Rensselaer Polytechnic Institute**, Troy, NY.
- Ph.D. in Electrical Computer, and Systems Engineering
- Advisor: Prof. Ali Tajer
- Dissertation: Causal Learning via Interventions: Estimation and Design

08.2018– 05.2020 **Rensselaer Polytechnic Institute**, Troy, NY.
- M.S., in Electrical Computer, and Systems Engineering
- Advisor: Prof. Ali Tajer

09.2013– 06.2018 **Bogazici University**, Istanbul, Turkey.
- B.S., in Electrical and Electronics Engineering
- Advisor: Prof. Murat Saraclar

Selected Publications

JMLR'25 **Score-based Causal Representation Learning: Linear and General Transformations**,
B. Varıcı, E. Acartürk, K. Shanmugam, A. Kumar, and A. Tajer.
Journal of Machine Learning Research (accepted for publication), 2025

AISTATS'24 **General Identifiability and Achievability for Causal Representation Learning**,
B. Varıcı, E. Acartürk, K. Shanmugam, and A. Tajer.
International Conference on Artificial Intelligence and Statistics, May 2024 (oral presentation)

JMLR'23 **Causal Bandits for Linear Structural Equation Models**,
B. Varıcı, K. Shanmugam, P. Sattigeri, and A. Tajer.
Journal of Machine Learning Research, 2023

ICML'25 **Contextures: Representations from Contexts**,
R. Zhai, K. Yang, **B. Varıcı**, CP. Tsai, and P. Ravikumar.
International Conference on Machine Learning, 2025

NeurIPS'24 **Interventional Causal Discovery in a Mixture of DAGs**,
B. Varıcı, D. Katz-Rogozhnikov, D. Wei, P. Sattigeri, and A. Tajer.
Conference on Neural Information Processing Systems, 2024

Additional Publications

NeurIPS'24 **Linear Causal Representation Learning from Unknown Multi-node Interventions**,
B. Varıcı, E. Acartürk, K. Shanmugam, and A. Tajer.
Conference on Neural Information Processing Sytems, 2024

NeurIPS'24 **Sample Complexity of Interventional Causal Representation Learning**,
E. Acartürk, **B. Varıcı**, K. Shanmugam, and A. Tajer.
Conference on Neural Information Processing Sytems, 2024

preprint **Score-based Causal Representation Learning with Interventions**,
B. Varıcı, E. Acartürk, K. Shanmugam, A. Kumar, and A. Tajer.
arXiv:2301.08230, 2023

TMLR'24 **Separability Analysis for Causal Discovery in Mixture of DAGs**,
B. Varıcı, D. Katz-Rogozhnikov, D. Wei, P. Sattigeri, and A. Tajer.
Transactions on Machine Learning Research, 2024

UAI'22 **Intervention Target Estimation in the Presence of Latent Variables**,
B. Varıcı, K. Shanmugam, P. Sattigeri, and A. Tajer.
The Conference on Uncertainty in Artificial Intelligence, 2022

NeurIPS'21 **Scalable Intervention Target Estimation in Linear Models**,
B. Varıcı, K. Shanmugam, P. Sattigeri, and A. Tajer.
Conference on Neural Information Processing Systems, 2021

AISTATS'25 **On the Consistent Recovery of Joint Distributions from Conditionals**,
M. Majid, R. Pukdee, V. Agrawal, **B. Varıcı**, and P. Ravikumar.
International Conference on Artificial Intelligence and Statistics, 2025

JSAIT'24 **Robust Causal Bandits for Linear Models**,
Z. Yan, A. Mukherjee, **B. Varıcı**, and A. Tajer.
IEEE Journal on Selected Areas in Information Theory, 2024

ISIT'24 **Improved Bound for Robust Causal Bandits with Linear Models**,
Z. Yan, A. Mukherjee, **B. Varıcı**, and A. Tajer.
International Symposium on Information Theory, 2024

AISTATS'21 **Learning Shared Subgraphs in Ising Model Pairs**,
B. Varıcı*, S. Sihag*, and A. Tajer.
International Conference on Artificial Intelligence and Statistics, 2021

Work Experience

09–12.2022 **MIT-IBM Watson AI Lab**, Cambridge, MA.
- Visiting Research Scholar
- Collaborators: Dr. Dmitriy A Katz, Dr. Prasanna Sattigeri, Dr. Dennis Wei
- Worked on causal discovery of a mixture of DAGs, published our results for observational data [TMLR-2024] and interventional data [NeurIPS-2024].

05–08.2020 **IBM Research**, remote.
- Research Intern
- Mentors: Dr. Prasanna Sattigeri, Dr. Karthikeyan Shanmugam
- Project: Disentangled generative modeling with an induced causal latent space.

06–08.2017 **Speech Enabled Smart Technologies**, Istanbul, Turkey.
- Research Intern
- Project: Built neural networks for a speaker identity verification system.

Honors & Awards

2020–2024 Rensselaer-IBM AI Fellowship

2024 Allen B. Dumont Prize (RPI ECSE doctoral dissertation award)

2023 NeurIPS Top Reviewer

2023 UAI Top Reviewer

2022 Belsky Award for RPI Computational Sciences and Engineering

2022 Jerry Dziuba ECSE Graduate Student Service Award

2013–2018 Undergraduate Science Fellowship of Government of Turkey

2012 Silver Medal, Turkish National Mathematical Olympiad

2012 Silver Medal, International Balkan Mathematical Olympiad

2010 Gold Medal, International Junior Balkan Mathematical Olympiad

Organizing

02.2025 **Causal Representation Tutorial at AAAI**.

- Co-organizers: Ali Tajer, Emre Acartürk, Karthikeyan Shanmugam

Invited Talks

Causal Representation Learning

03.2025 Artificial Intelligence with Causal Techniques Workshop at AAAI

02.2025 Booth School of Business at University of Chicago – Aragam Group

03.2024 Carnegie Mellon University - Statistical & Symbolic Learning Group

12.2023 Causal Representation Learning Workshop at NeurIPS

Causal Bandits

02.2023 IBM Causal Reinforcement Learning Group

Teaching Experience

2024–2025 **Guest Lecturer**, Carnegie Mellon University.

- CMU 10716: Advanced Machine Learning - Clustering
- CMU 10716: Advanced Machine Learning - Causality
- CMU 10741: Representation Learning - Causal Representation Learning

2018–2020 **Teaching Assistant**, Rensselaaer Polytechnic Institute.

- ECSE 2410: Signals and Systems
- ECSE 2610: Computer Components and Operations
- ECSE 1010: Introduction to Electrical, Component and Systems Engineering

Review Services

Journals IEEE Transactions on Signal Processing (2022–), Transactions on Machine Learning (2024–)

Conferences NeurIPS (2020–2025), ICML (2024), AISTATS (2023–2025), AAAI (2023), UAI (2023–2024), CLeaR (2025)