

BURAK VARICI

Current Position

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

Education

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

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

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

Professional 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.

Selected Publications

- JMLR'25 **Score-based Causal Representation Learning: Linear and General Transformations**,
B. Varici, 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. Varici, 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. Varici, K. Shanmugam, P. Sattigeri, and A. Tajer.
Journal of Machine Learning Research, 2023

- ICML'25 **Contextures: Representations from Contexts**,
R. Zhai, K. Yang, **B. Varici**, CP. Tsai, and P. Ravikumar.
International Conference on Machine Learning, 2025
- NeurIPS'24 **Interventional Causal Discovery in a Mixture of DAGs**,
B. Varici, 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. Varici, 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. Varici**, K. Shanmugam, and A. Tajer.
Conference on Neural Information Processing Sytems, 2024
- preprint **Score-based Causal Representation Learning with Interventions**,
B. Varici, 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. Varici, 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. Varici, 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. Varici, 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. Varici**, and P. Ravikumar.
International Conference on Artificial Intelligence and Statistics, 2025
- JSAT'24 **Robust Causal Bandits for Linear Models**,
Z. Yan, A. Mukherjee, **B. Varici**, 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. Varici**, and A. Tajer.
International Symposium on Information Theory, 2024
- AISTATS'21 **Learning Shared Subgraphs in Ising Model Pairs**,
B. Varici^{*}, S. Sihag^{*}, and A. Tajer.
International Conference on Artificial Intelligence and Statistics, 2021

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**, Rensselaer 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)