BURAK VARICI

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Education

Rensselaer Polytechnic Institute, Troy, NY — *August 2018 - Present*
Ph.D. in Electrical Engineering, Advisor: Dr. Ali Tajer — GPA: 3.93/4.0

Rensselaer Polytechnic Institute, Troy, NY — *August 2018 - May 2020*
M.Sc. in Electrical Engineering — GPA: 3.9/4.0

Bogazici University, Istanbul, Turkey — *September 2013 - June 2018*
B.Sc. in Electrical & Electronics Engineering — GPA: 3.43/4.0

University of Wisconsin-Madison, Madison, WI — *Spring 2016*
Exchange Student in Electrical & Computer Engineering — SPA: 3.62/4.0

Research Projects

RPI Information Sciences Group — *Troy, NY*
RPI-AIRC Scholar, Advisor: Dr. Ali Tajer — September 2020 - Present

Broadly interested in causal inference and interventions on graphical models. Developed consistent algorithms to learn from interventional data in both causally sufficient and insufficient systems (publications in NeurIPS'21 and UAI'22). Designed and analyzed causal bandit algorithms with relaxed assumptions (publication in JMLR, 2023). Established identifiability results on causal representation learning via interventions (paper is under review).

RPI Information Sciences Group — *Troy, NY*
Graduate Research Assistant, Advisor: Dr. Ali Tajer — January - October 2020

Researched on structure learning of shared subgraphs for multiple undirected graphical models. Proposed an algorithm and analyzed its sample and computational complexities. Lead to publication in AISTATS.

RPI Intelligent Systems Laboratory — *Troy, NY*
Graduate Research Assistant, Advisor: Dr. Qiang Ji — August 2018 - December 2019

Researched on low-cost eye-gaze tracking systems, utilized probabilistic methods to personalize deep models with limited annotation.

Bogazici University Signal and Image Processing Laboratory — *Istanbul, Turkey*
Senior Design Project, Advisor: Dr. Murat Saraclar — October 2017 - May 2018

Investigated neural network based distance metrics for Query-by-example speech (QbE) search on low-resource languages.

University of Wisconsin-Madison — *Madison, WI*
Undergraduate Research Assistant, Advisor: Dr. Xinyu Zhang — May - July 2016

Explored tracking the orientation of batteryless objects via RFID tags. Analyzed characteristics of different frequency channels to integrate localization.

Professional Experience

The Rensselaer-IBM AI Research Collaboration
AI Horizons Extern, Mentors: Dr. Prasanna Sattigeri, Dr. Karthikeyan Shanmugam — May - August 2020

Researched on combining the causal discovery process with generative modeling and inducing a latent space representative of the underlying structure.

Speech Enabled Smart Technologies — *Istanbul, Turkey*

Summer Intern June - August 2017

Built neural networks for a speaker identity verification system.

Publications

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

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

B. Varıcı, K. Shanmugam, P. Sattigeri, and A. Tajer, "Scalable Intervention Target Estimation in Linear Models", *Neural Information Processing Systems* (NeurIPS), 2021.

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

Preprints

B. Varıcı, E. Acartürk, K. Shanmugam, and A. Tajer, "General Identifiability and Achievability for Causal Representation Learning", *under review.*

B. Varıcı, E. Acartürk, K. Shanmugam, A. Kumar, and A. Tajer, "Score-based Causal Representation Learning with Interventions", *under review.*

B. Varıcı, D. Katz-Rogozhnikov, A. Tajer, D. Wei, and P. Sattigeri, "Separability Analysis for Causal Discovery in Mixture of DAGs ", *under review.*

Z. Yan, A. Mukherjee, **B. Varıcı**, and A. Tajer, "Robust Causal Bandits for Linear Models", *under review.*

Skills and Coursework

Technical: Python, TensorFlow/Keras, MATLAB

Relevant Courses: Learning from Data, Deep Learning, Probabilistic Graphical Methods, Distributed Machine Learning, Trustworthy Machine Learning, Bandit Algorithms, Detection and Estimation Theory, Intro. to Optimization, Computational Optimization, Computer Vision, Speech Processing.

Awards & Honors

Jerry Dziuba ECSE Graduate Student Service Award *2022*

Belsky Award for Computational Sciences and Engineering *2022*

The Rensselaer-IBM AI Research Collaboration Fellowship *2020*

Undergraduate Science Fellowship of Government of Turkey *2013 - 2018*

University Entrance Exam - Ranked 276^{th} out of 1.8 million candidates *2013*

Turkish National Mathematical Olympiad - Silver Medal *2012*

International Balkan Mathematical Olympiad - Silver Medal *2012*

Teaching Experience

Teaching Assistance, Rensselaer Polytechnic Institute Troy, NY
ECSE 2410: Signals and Systems *Spring 2020*

Teaching Assistance, Rensselaer Polytechnic Institute Troy, NY
ECSE 2610: Computer Components and Operations *Spring 2019*

Teaching Assistance, Rensselaer Polytechnic Institute Troy, NY
ECSE 1010: Introduction to Electrical, Component and Systems Engineering *Fall 2018*