

ARMEEN TAEB

✉ ataeb@uw.edu | 🏠 armeentaeb.github.io/index/

RESEARCH INTERESTS

Model selection in non-traditional settings, graphical models, domain adaptation, causal inference, latent-variable modeling, mathematical optimization, high-dimensional statistics, applications of data science

ACADEMIC POSITIONS

- 2023- **Affiliate Faculty, eScience Institute**, University of Washington
- 2023- **Affiliate Faculty, Center for Statistics and the Social Sciences**, University of Washington
- 2022- **Assistant Professor, Department of Statistics**, University of Washington
- 2019-2022 **Foundations of Data Science Postdoctoral Associate**, ETH Zürich

PROFESSIONAL POSITIONS

- 2017 **Data science intern**, Yahoo Inc.
- 2015 **Data science intern**, Jet Propulsion Laboratory, NASA
- 2012 **DSP Research intern: Baraniuk lab**, Rice University
- 2010-2011 **DSP Research intern: Hughes lab**, CU Boulder
- 2010 **Summer intern**, National Institute of Standards and Technology

EDUCATION

- California Institute of Technology** *Pasadena, CA*
PHD, ELECTRICAL ENGINEERING *2015 - 2019*
- California Institute of Technology** *Pasadena, CA*
M.S. IN ELECTRICAL ENGINEERING *2013 - 2015*
- University of Colorado at Boulder** *Boulder, CO*
B.S. IN ELECTRICAL ENGINEERING AND APPLIED MATHEMATICS *2009 - 2013*

PUBLICATIONS

PREPRINT

- S. Engelke, **A. Taeb**, “Extremal graphical modeling with latent variables”
◇ 2024
- X. Shen, P. Bühlmann, **A. Taeb**, “Causality-oriented robustness: exploiting general additive interventions”
◇ 2023
- A. Taeb**, J. Gamella, C. Heinze-Deml, P. Bühlmann, “Learning and scoring Gaussian latent causal models with unknown additive interventions”
◇ 2023
- J. Gamella, **A. Taeb**, C. Heinze-Deml, P. Bühlmann, “Characterization and greedy learning of Gaussian structural causal models under unknown interventions”
◇ 2022

JOURNAL PUBLICATIONS

- A. Taeb**, P. Bühlmann, V. Chandrasekaran “Model selection over partially ordered sets”
◇ 2024 – Proceedings of National Academy of Sciences
- Y., Chen, **A. Taeb**, and P. Bühlmann, “A look at robustness and stability of ℓ_1 vs. ℓ_0 regularization: discussion of papers by Bertsimas et al. and Hastie et al.”
◇ 2020 – Statistical Science
- A. Taeb**, P. Shah, and V. Chandrasekaran, “False discovery and its control in low-rank estimation”

◇ 2020 – Journal of Royal Statistical Society, Series B

A. Taeb, P. Shah, and V. Chandrasekaran, “Interpreting latent variables in factor models via convex optimization”

◇ 2018 – Mathematical Programming

A. Taeb, J. Reager, M. Turmon, and V. Chandrasekaran, “A statistical graphical model of the California reservoir network”

◇ 2017 – Water Resources Research

H. Qi, **A. Taeb**, and S. Hughes, “Visual stylometry using background selection and wavelet- HMT-based Fisher Information distances for attribution and dating of impressionist paintings”

◇ 2012 – EURASIP Signal Processing

BOOKS

D. Sanz-Alonso, A. Stuart, and **A. Taeb**, “Inverse problems and data assimilation”

◇ 2023 – Cambridge University Press

PHD THESIS

“Latent-variable modeling: inference, algorithms, and applications”

◇ 2019 – W. P. Carey & Co. Prize for outstanding thesis in Applied Mathematics

CONFERENCE PROCEEDINGS AND WORKSHOPS

A. Taeb, N. Ruggeri, C. Schnuck, F. Yang, “Provable concept learning for interpretable predictions via variational inference”

◇ 2022 – ICML workshop on AI4Science

A. Taeb, A. Maleki, C. Studer, and R. Baraniuk, “Maximin analysis of message passing algorithms for block sparse signals”

◇ 2013 – Signal Processing with Adaptive Sparse Structured Representations (SPARS)

TECHNICAL REPORTS

M. Azadkia, **A. Taeb**, P. Bühlmann, “A fast non-parametric approach for local causal structure learning”

◇ 2022 – arXiv 2111.14969

A. Taeb, P. Shah, and V. Chandrasekaran, “Learning exponential family graphical models with latent variables using regularized conditional likelihood”

◇ 2020 – arXiv 2010.09386

GRANTS

“False discovery control for causal structure learning”

◇ 2023-2024; Royalty Research Fund, University of Washington; \$40k

“Interpretable predictions for medical imaging diagnostics”

◇ CO-PI: with F. Yang, J. Vogt, and E. Ozkan

◇ 2021-2023; Hasler Foundations, Switzerland; CHF 510k

AWARDS & HONORS

2019-2021 Foundations of Data Science Postdoctoral Fellowship, ETH

2020 W. P. Carey & Co. Prize for outstanding thesis in Applied Mathematics, Caltech

2016-2018 Resnick Institute Fellowship for Sustainability Research, Caltech

2013-2014 Electrical Engineering Graduate Fellowship, Caltech

2013 GRFP Honorable Mention, NSF

2013 Distinguished Senior in Electrical Engineering, University of Colorado at Boulder

TEACHING & MENTORING

TEACHING

Wi. 2024	STAT 538, Statistical Learning , Graduate Course, 18 Students	UW
Wi. 2024	STAT 528, Applied Statistics Capstone , Graduate Course, 38 Students	UW
Fa. 2023	STAT 591, Multiple Testing and Modern Inference , Graduate Course, 12 Students	UW
Sp. 2023	BIOST 558, Statistical Machine Learning for Data Scientists , Graduate Course, 57 Students	UW
Wi. 2023	STAT 538, Statistical Learning , Graduate Course, 4 Students	UW
Wi. 2023	STAT 528, Applied Statistics Capstone , Graduate Course, 36 Students	UW
Fa. 2020	Seminar on Multiple Testing for Modern Data Science , Co-Instructor (with Matthias Löffler)	ETH
Fa 2018	Inverse Problems & Data Assimilation , Co-instructor (with Andrew Stuart)	UDSI

MENTORING

2023-	Xiaozhu Zhang , “False discovery control in highly correlated variable selection” – PhD	UW Statistics
2023-	Bojun Chen , “Testing for model selection over partially ordered sets” – MS	UW Statistics
2022	Felix Hafenmair , “High-dimensional causal discovery” – MS	ETH
2022	Zipei Geng , “Nonparametric Variable Selection under Latent Confounding” – MS	ETH
2021	Carina Schnuck , “Provably learning interpretable and predictive latent features” – MS	ETH
2020-2021	Juan Gamella , “Active learning for causal inference” – MS	ETH
2020-	Dennis Frauen , “Inference with highly correlated variables” – MS	Göttingen
2020	Judy Beestermoeller , “Learning Gaussian graphical models” – MS	ETH
2020	Mattias Hemming , “Causal inference and low-rank estimation” – MS	ETH

ACADEMIC SERVICE & LEADERSHIP

PHD COMMITTEES

2024	Ph.D. Committee Member and reader , for Sara Laplante, advisors: Ema Perkovic, Department of Statistics, Univeristy of Washington.
2024	Ph.D. Committee Member and reader , for Renak Mehta, advisors: Zaid Harchaoui, Department of Statistics, Univeristy of Washington.
2024	Ph.D. Graduate Student Representative , for Vince Cooper, advisors: Kyle Armour, Cecilia Bitz, and Greg Hakim, Department of Atmospheric Sciences, Univeristy of Washington.

SCIENTIFIC EVENTS AND ORGANIZATION

2024	Co-organizer of the 24th IMS New Researcher Conference , Co-organized with Yuan Jiang and Pragya Sur.
2024	Co-organizer of a contributed session in IMS-Bernoulli Conference in Probability and Statistics , Co-organized with Mateo Diaz, topic: “False discovery control in non-standard settings”.
2024	Co-organizer of invited session in American Causal Inference Conference , Co-organized with Ali Shojaie, topic: “Optimization methods for causal discovery”.
2023-	Organizer: IMS New Researcher Group Seminar Series , Organize talks from young researchers in data science.
2023	Co-organizer of minisymposium in SIAM Conference on Optimization , Co-organized with Xinwei Shen, topic: “Application of optimization for causal discovery”.
2020-2022	Co-organizer: Young Data Science Seminar Zürich , Organize talks from young researchers.
2017	Co-organizer: Co-organizer of minisymposium in SIAM Conference on Optimization , Co-organized with Yong Sheng Soh, topic: “Lift-and-project methods for data science”.

REVIEWING

Journals: Annals of Statistics, Bernoulli, Biometrika, Electronic Journal of Statistics, Journal of American Statistical Association, Journal of Machine Learning Research, Journal of Royal Statistical Society, SIAM Journal of Mathematics of Data Science, Statistical Science

Conferences: Neurips, UAI

CITIZENSHIP at the UW

- 2024 Member of the faculty hiring committee for TTAP, TAP, and AAP, Department of Statistics
- 2022- Member of PhD admissions committee, Department of Statistics
- 2023- Member of the M.S. admission committee, Department of Statistics
- 2023- Member of the Prelim examination committee, Department of Statistics
- 2023 Member of the Diversity Inclusion Community and Equity (DICE) committee, Department of Statistics

TALKS

“QUANTIFYING RARE EVENTS WITH EXTREMAL GRAPHICAL MODELS”

- ◇ Department of Atmospheric Sciences, University of Washington, May 2024

“INTEGER PROGRAMMING FOR LEARNING DIRECTED ACYCLIC GRAPHS”

- ◇ American Causal Inference Conference, May 2024

“ON FALSE POSITIVE ERROR”

- ◇ Bernoulli-IMS World Congress in Probability and Statistics, August 2024
- ◇ Marshall Statistics Seminar, University of Southern California, April 2024
- ◇ eScience Institute, University of Washington, April 2024
- ◇ International Conference on Selective Inference, March 2024
- ◇ Department of Statistical Science, Duke University, December 2023
- ◇ Department of Biostatistics, University of Washington, November 2023

“CAUSALITY AND ROBUSTNESS FROM HETEROGENEOUS DATA”

- ◇ Interactive Causal Learning Conference, Boca Raton, December 2023
- ◇ Department of Industrial and Systems Engineering, University of Washington, May 2023
- ◇ Department of Economics, University of Washington, May 2023

“PROVABLE CONCEPT LEARNING FOR INTERPRETABLE PREDICTIONS”

- ◇ Department of Medicine, University of California at San Francisco, November 2022

“CAUSAL STRUCTURE LEARNING WITH UNKNOWN NOISE INTERVENTIONS”

- ◇ SIAM Conference on Optimization, June 2023
- ◇ American Causal Inference Conference, May 2023
- ◇ Department of Statistics, University of Washington, October 2022
- ◇ COMPSTAT, August 2022

“PERTURBATIONS AND CAUSALITY IN GAUSSIAN LATENT VARIABLE MODELS”

- ◇ CMStatistics, December 2021
- ◇ Online Causal Inference Seminar, June 2021
- ◇ SIAM Conference on Algebraic Geometry, August 2021
- ◇ SIAM Conference on Optimization, July 2021
- ◇ Seminar for Statistics and Data Science, TU München, March 2021

“FALSE DISCOVERY AND ITS CONTROL IN LOW-RANK ESTIMATION”

- ◇ SIAM Conference on Optimization, May 2021
- ◇ Statistics@UPF Seminars, March 2020
- ◇ SIAM Conference of Algebraic Geometry, June 2019
- ◇ Department of Computer Science, Northeastern, December 2018
- ◇ Laboratory for Information and Decision Systems, MIT, November 2018
- ◇ Workshop on New Signal Models and their Information Content, Banff, November 2018
- ◇ Statistics Seminar, University of Chicago, October 2018
- ◇ Seminar For Statistics: ETH Zürich, September 2018

“FROM DATA SCIENCE TO HYDROLOGY, CALIFORNIA RESERVOIRS DURING DROUGHT”

- ◇ Wonderful Company HQ, July 2018
- ◇ RAND Corporation, June 2018
- ◇ International Congress on Environmental Modelling and Software, May 2018
- ◇ San Francisco Water Public Utilities Commission, March 2018

“INTERPRETING LATENT VARIABLES VIA CONVEX OPTIMIZATION”

- ◇ Allerton Conference on Communication, Control, and Computing, October 2017
- ◇ SIAM Optimization, May 2017