Derek Lars Hansen

✉ dereklh@umich.edu
⌂ http://www-personal.umich.edu/~dereklh/

Areas of Expertise

- Bayesian methods (Sequential Monte Carlo, variational inference)
- Probabilistic deep learning
- Statistical computing on HPCs and GPUs
- Applications in physical sciences, including astronomy and oceanography

Education

2023	**PhD in Statistics and Scientific Computing** University of Michigan Advisor: Jeffrey Regier
2016	**Bachelor of Science in Mathematics & Bachelor of Arts in Economics** University of Oklahoma

Work Experience

2022	**a, Amazon Web Services** Applied Scientist Intern
2021	**▭ KLA Corporation** Algorithms Intern
2016 - 2018	**🏛 Federal Reserve Board of Governors** Senior Research Assistant

Publications

Accepted

Derek Hansen, Danielle C. Maddix, Shima Alizadeh, Gaurav Gupta, and Michael W. Mahoney (2023). "Learning Physical Models that Can Respect Conservation Laws". Proceedings of the 40th International Conference on Machine Learning. 🗎 arxiv:2302.11002. ⍟ amazon-science/probconserv.

Derek Hansen, Danielle C. Maddix, Shima Alizadeh, Gaurav Gupta, and Michael W. Mahoney (2023). "Learning Physical Models that Can Respect Conservation Laws". ICLR 2023 Workshop on Physics for Machine Learning.

Derek Hansen, Brian Manzo, and Jeffrey Regier (2022). "Normalizing Flows for Knockoff-free Controlled Variable Selection". Advances in Neural Information Processing Systems 36. 🗎 arxiv:2106.01528. ⍟ dereklhansen/flowselect.

Derek Hansen, Ismael Mendoza, Runjing Liu, Ziteng Pang, Zhe Zhao, Camille Avestruz, Jeffrey Regier (2022). "Scalable Bayesian Inference for Detection and Deblending in Astronomical Images". ICML 2022 Workshop on Machine Learning for Astrophysics. 🗎 arxiv:2207.05642. ⍟ prob-ml/bliss

Under Review

Derek Hansen and Drew Yarger. "A probabilistic model of ocean floats under ice".
📄 arxiv:2210.00118

Dobrislav Dobrev, **Derek Hansen**, and Pawel Szerszen. "A Randomized Missing Data Approach to Robust Filtering with Applications in Economics and Finance".
📄 arxiv:2104.14664.

Contributed Discussion

Rob Trangucci, **Derek Hansen**, and Yang Chen. "Contributed Discussion". In: Leisen, F., Villa, C., & Walker, S. G. (2020). On a Class of Objective Priors from Scoring Rules (with Discussion). Bayesian Analysis, 15(4), 1345–1423. 📄 doi:10.1214/19-BA1187.

Awards & Fellowships

2018-2023	**Graduate Research Fellowship Program (GRFP)** National Science Foundation
2019	**Outstanding First-Year PhD Student** University of Michigan Department of Statistics

Teaching Experience

Graduate Student Instructor

Winter 2022 Winter 2021	**Stats 507: Data Science and Analytics using Python** A graduate-level introduction to Python for data analysis.
Fall 2020	**Stats 306: Introduction to Statistical Computing** An undergraduate course on data visualization using the ggplot package in the R language.

Workshops

Summer 2020	**Fall Prep Workshop** Designed and led a week-long workshop of analysis and linear algebra for incoming PhD students.
Spring 2020	**Applied Qualifying Exam (QR) Workshop** Designed and led a workshop in statistics and R for PhD students taking the Applied QR.

Software

Bayesian Light Source Separator (BLISS): https://github.com/prob-ml/bliss

Oral Presentations

2022	**MSSISS** University of Michigan *Scalable Bayesian Inference for Detecting and Deblending Stars and Galaxies in Crowded Fields*

2022	**Ocean Sciences Meeting**
	Virtual
	ArgoSSM: A State-space Model of Ocean Floats under Ice
2021	**Data for Public Good**
	University of Michigan
	ArgoSSM: A Bayesian state-space framework for predicting the location of missing temperature sensors in the Southern Ocean
2019	**Conference on High Frequency Finance and Analytics**
	Stevens Institute of Technology
	A Randomized Missing Data Approach to Robust Filtering with Applications in Economics and Finance

Poster Presentations

2022	**Neurips**
	New Orleans Convention Center
	Learning Physical Models that Can Respect Conservation Laws
2020	**MIDAS Symposium**
	University of Michigan
	ArgoSSM: A Bayesian state-space framework for predicting the location of missing temperature sensors in the Southern Ocean
2019	**MSSISS**
	University of Michigan
	A Randomized Missing Data Approach to Robust Filtering with Applications in Economics and Finance
2018	**MIDAS Symposium**
	University of Michigan
	A Randomized Missing Data Approach to Robust Filtering with Applications in Economics and Finance

Reviewing

- ICML 2022
- Neurips 2022
- Journal of the American Statistical Association (Case Studies & Applications)