DEREK L. HANSEN

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EDUCATION

University of Michigan   Ann Arbor, MI

Ph.D. in Statistics and Scientific Computing   Expected May 2023

- National Science Foundation Graduate Research Fellowship (May 2018 - Present)
- Outstanding first-year Statistics PhD student award (May 2019)

University of Oklahoma   Norman, OK

B.S. in Mathematics & B.A. in Economics, *Summa Cum Laude*   May 2016

RELEVANT EXPERIENCE

a Amazon Web Services AI Labs   Palo Alto, CA
Applied Scientist Intern   May 2022 - Sep 2022

· Developed framework that incorporates physical knowledge into neural network predictions.
· Demonstrated 50% reduction in error over baseline on challenging fluid flow problem.
· Lead author on manuscript targeting top machine learning conference (currently in progress).

🖥 KLA Corporation   Ann Arbor, MI
Algorithms Intern   May 2021 - Aug 2021

· Developed neural network architecture for computer vision segmentation task on lithography photo masks.
· Achieved over 99.5% recall and precision across all segmentation classes.
· Designed interactive web app to explore model-predicted images using Dash and Plotly.

🏛 Federal Reserve Board of Governors   Washington, DC
Senior Research Assistant   July 2016 - May 2018

· Co-authored method for making state-space models of time-series robust to outliers and misspecification.
· Deployed method on 3-year inflation forecasting model, leading to 14% reduction in error.
· Presented at the Conference on High Frequency Finance and Analytics.

SKILLS

Deep Learning Techniques: generative modeling, variational autoencoders, normalizing flows, transformers, image segmentation, neural processes
Statistical Techniques: Bayesian inference, Markov chain Monte Carlo, particle filtering, time series, variational inference, controlled feature selection, data visualization (ggplot2)
Programming Languages: Python (Pytorch, scikit-learn, Tensorflow 2), R, Julia, C
Computing: Bash, Github Actions, Linux (Ubuntu, Fedora, Arch, NixOS)

SELECTED PUBLICATIONS

Derek Hansen, Brian Manzo, and Jeffrey Regier (2022). "Normalizing Flows for Knockoff-free Controlled Variable Selection". Advances in Neural Information Processing Systems 36.

TEACHING EXPERIENCE

Graduate Student Instructor   Ann Arbor, MI
Statistics Department, *University of Michigan*   Sep 2020 - May 2022
- · STATS 507: Data Science and Analytics using Python
- · STATS 306: Introduction to Statistical Computing

Fall Prep Workshop Leader   Ann Arbor, MI
Statistics Department, *University of Michigan*   Aug 2020
- · Designed and led a week-long workshop of analysis and linear algebra for incoming first-year PhD students.

Applied Qualifying Exam (QR) Workshop Leader   Ann Arbor, MI
Statistics Department, *University of Michigan*   Apr 2020 - May 2020
- · Developed and taught a multi-week workshop in statistics and R for PhD students taking the Applied QR.
- · Covered exploratory data analysis (EDA), developing good questions from datasets, applying statistical methods, and efficient statistical programming under time pressure.
- · Synthesized materials from first-year PhD courses and the textbook *R for Data Science*.