Darren Homrighausen

CONTACT INFORMATION

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PROFESSIONAL POSITIONS

Southern Methodist University, **Masters in Data Science** Dallas, TX

2019 - present: Adjunct Faculty in Masters in Data Science Program

Southern Methodist University, **Department of Statistical Science** Dallas, TX

2016 - 2018: Visiting Assistant Professor of Statistics

Colorado State University, **Statistics Department** Fort Collins, CO

2012 - 2016: Assistant Professor of Statistics

EDUCATION

Carnegie Mellon University, Pittsburgh, Pennsylvania USA

Ph.D in Statistics, May 2012

Dissertation: "Sequential estimation and detection in statistical inverse problems"
Advisor: Christopher R. Genovese

M.S. in Statistics, December 2008

University of Colorado, Boulder, Colorado USA

Graduate work in Applied Mathematics, 2006-2007

- Left to pursue Ph.D in statistics.

University of Colorado, Denver, Colorado USA

B.A. in Economics, B.A. in Mathematics, May 2006

PUBLICATIONS

Homrighausen, D. and McDonald, D.J. "Compressed and Penalized Linear Regression" (Resubmitted to Journal of Computational & Graphical Statistics) https://arxiv.org/abs/1705.08036

Homrighausen, D. and McDonald, D.J. (2018) "A study on tuning parameter selection for the high-dimensional lasso," *Journal of Statistical Computation and Simulation* Vol. 88, pp. 2865-2892.

Linginer, K.; Anderson, N.; Raimondi, J.; **Homrighausen, D.**; Wohl, E. "Discharge pulses in temperate and tropical rain forest headwater stream networks," (Submitted)

Homrighausen, D. and McDonald, D.J. (2017) "Risk consistency of cross-validation and lasso-type procedures," *Statistica Sinica* Vol. 27, pp. 1017-1036

Homrighausen, D. and McDonald, D.J. (2016) "Approximate principal components analysis of large data sets via the Nyström and column-sampling methods," *Journal of*

Computational and Graphical Statistics Vol. 25, No. 2, pp. 344-362

Homrighausen, D. and McDonald, D.J., (2014) "Leave-one-out cross-validation is risk consistent for lasso," *Machine Learning* 97, pp 65-78

Homrighausen, D. and McDonald, D.J. (2013) "The lasso, persistence, and cross-validation," Proceedings of the 30th International Conference on Machine Learning, eds. S. Dasgupta, and D. McAllester, JMLR W&CP 28(3), 1031–1039.

Homrighausen, D. and Genovese, C.R. (2013) "Efficient estimators for sequential and resolution-limited inverse problems," *Electronic Journal of Statistics* 7, pp 2098-2130.

Becker, A.C.; **Homrighausen, D.**; Connolly, A.J.; Genovese, C.R.; Owen, R.; Bickerton, S.J.; and Lupton R. (2012)"Regularization techniques for PSF-matching kernels. I. Choice of kernel basis," *Monthly Notices of the Royal Astronomical Society.* Vol. 425, No. 2, pp. 1341-1349.

Stephen, K.E.; **Homrighausen, D.**, DePalma, G., Nakatsu, C., and Irudayaraj, J. (2012) "Using RAMAN spectroscopy to classify highly related bacteria." *Analyst.* Vol. 137, pp. 4280 - 4286.

Homrighausen, D.; Genovese, C.R.; Connolly, A.J.; Becker, A.C.; and Owen, R. (2011) "Image coaddition with temporally varying kernels," in *Publications of the Astronomical Society of the Pacific*, Vol. 123, No. 907, pp. 1117-1126.

Richards, J.W.; **Homrighausen, D.**; Freeman, P.E; Schafer, C.M.; and Poznanski, D. (2011) "Semi-supervised learning for photometric supernova classification," *Monthly Notices of the Royal Astronomical Society.* Vol. 419, No. 2, pp. 1121-1135.

Technical Reports

McDonald, D.J., Shalizi, C.R., and **Homrighausen, D.**, "Macroeconometrics and empirical fantasy,"

Homrighausen, D. and McDonald, D.J., "Laplace Gaussian Filtering for nonlinear, non-Gaussian state space models,"

Homrighausen, D. and McDonald, D.J., "Spectral approximations in machine learning," arXiv:1107.4340 [stat.ML].

Grants

"Statistical and computational efficiency for massive datasets via approximation-regularization" Homrighausen, D. (PI) (NSF-DMS 1407543). (Awarded: \$70,000**; 2014 - 2016)

"High dimensional statistics for macroeconomic forecasting" Shalizi, C.R., McDonald, D.J., and Homrighausen, D. (CO-PI) Institute for New Economic Thinking (INET). (Awarded: \$50,000**; 2014 - 2016)

"High dimensional statistics for time-series forecasting." Shalizi, C.R., McDonald, D.J., and Homrighausen, D. (NSF). (unfunded)

"New approaches to computationally intensive inverse problems in nonlinear electromagnetic scattering." Homrighausen, D., et al. National Science Foundation. (Unfunded)

**my share of grant.

Invited Short Courses

Institute for New Economic Thinking (INET) Conference. Hong Kong, April 2013
"Machine Learning Methods in Economics"

Invited Presentations

- Texas A&M University, Statistics Fepartment (Spring, 2018)
  "Compressed and Penalized Linear Regression"
  https://darrenho.github.io/compressedLStalk.pdf
- Baylor, Statistics Department (Fall, 2017)
  "A General Framework for Addressing "Any" Machine Learning Problem"
  https://darrenho.github.io/seminar20170921.pdf
- Southern Methodist University, Operations Research and Statistics Towards Integrated Analytics (Spring, 2017)
  "A General Framework for Addressing "Any" Machine Learning Problem"
- Southern Methodist University, Statistical Sciences department (Spring, 2016)
  "Improved Computational and Statistical Efficiency via Compressed Least Squares"
- University of Colorado, Denver, Math/Stat department (Spring, 2016)
  "Improved Computational and Statistical Efficiency via Compressed Least Squares"
- NBER/NSF Time Series Conference [Vienna, Austria] (Fall, 2015)
  "Greedy Function Approximation for Macroeconomic Forecasting"
- University of Colorado, Boulder, Applied Math department (Fall, 2015)
  "Photometric Supernovae Classification"
- European Conference on Machine Learning [Nancy, France] (Fall, 2014)
  "Leave-one-out cross-validation is risk consistent for lasso"
- Institute for New Economic Thinking Conference [Toronto, Canada] (Spring, 2014)
  "High dimensional statistics for macroeconomic forecasting"
- University of Indiana, Bloomington, Statistics department (Fall, 2013)
  "The lasso, persistence, and cross-validation"
- Argonne National Labs (Fall, 2013)
  "Approximate Bayesian Computation: From Electromagnetics to Astrostatistics"
- Colorado State University, Statistics department (Fall, 2012)
  "Detecting transients in mixed resolution image data"
- University of Indiana, Bloomington, Statistics department (Spring 2012)
  "Efficient estimators for sequential and resolution limited inverse problems"
- Colorado State University, Statistics department (Spring 2012)
  "Efficient estimators for sequential and resolution limited inverse problems"
- Conference on Data Analysis (CODA 2012)
  "Detecting transients in mixed resolution image data"

  Won $100 u.s.d. in best poster contest
- Statistical Challenges in Modern Astronomy (SCMA 2011)
  "FASTDetect: A stochastic process approach to detecting transients"
- SIAM conference on Data Mining (SDM 2011)
  "Efficient estimators for sequential and resolution limited inverse problems"

Contributed Presentations

- ASA conference, Denver, (2012)
- ASA conference, Pittsburgh, (2011,2012)
- Statistical Machine Learning Group, CMU (2010, 2011)
- Joint Statistical Meetings, Washington D.C. (2009)
- Astrostatistics Group, CMU (2010)

Teaching

• Foundations of Statistics I	(Masters, Spring 2019)
• Introduction to Data Science	(Masters, Spring 2017, Fall 2017, Spring 2018)
• Quantifying the World	(Masters, Fall 2016, Fall 2017)
• Undergraduate Statistics I	(undergraduate, Fall 2017)
• Categorical Data Analysis, GLMM	(PhD, Spring 2016)
• Statistical Learning and Data Mining	(Masters, Spring 2015, Spring 2016)
• Statistical Machine Learning	(PhD, Fall 2014, Fall 2015, Spring 2017, Spring 2018)
• Generalized Regression Methods	(Masters, Fall, 2012, Fall 2013, Fall 2018)
• Applied Multivariate Analysis	(undergraduate, Spring 2013, Spring 2014,Spring 2015)
• Statistics for Engineers	(undergraduate, Fall 2008)
• Statistics for Engineers	(undergraduate, Summer 2008)

Advising (completed)

Justin Raimondi	Advisor	(M.S. Statistics, 2017)	Discharge pulses in stream networks
Rafe McBeth	Committee	(PhD. Radiation Phys., 2017)	Developing radiation sensors for manned space exploration.
Xiyue Liao	Committee	(PhD. Statistics, 2016)	Shape constrained covariance function estimation.
Ben Goldman	Advisor	(M.S. Statistics, 2015)	Classifying supernovae with functional data analysis
Paul Harmon	Advisor	(B.S. Statistics, 2015)	Predicting front range housing prices (Honors project)
Greg Ellison	Advisor	(M.S. Statistics, 2014)	Using text mining to predict Ebay sales
Yi Hu	Advisor	(B.S. Statistics, 2014)	Investigating the tuning parameter selection of lasso
Gavan Tredoux	Committee	(M.S. Statistics, 2013)	Predicting student loan default using penalized regression

Advising (in progress)

Brody McCray	Advisor	(M.S. Statistics)	Predicting intra-day and inter-day Major League Baseball outcomes
Joel Ricklefs	Advisor	(M.S. Statistics)	Predicting recessions through machine learning.
Andrea Schumacher	Committee	(PhD. Atmosph. Sci.)	Estimating the maximum wind velocity of hurricanes.

Professional Service

Memberships:	*American Statistical Association*, *Institute of Mathematical Statistics*
Referee:	Journal of the American Statistical Association, Statistica Sinica (2), Statistics and Computing, ICML, IEEE Information Theory, Journal of Statistical Planning and Inference (2), Computational Statistics and Data Analysis, Journal of Optimization Theory, Journal of Nonparametric Statistics
Intra-department:	Stat Club (2017-2018), DataFest (2017-2019), Graduate student admissions (2012-2016), Department seminar (Spring, 2013, Spring 2015), Tenure Track Faculty Hiring Committee (2013-2014, 2015-2016), Graduate Committee (2014-2016)