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Charles R. Doss

Education

University of Washington
Ph.D. in Statistics, Advised by Jon Wellner — September 2008-August 2013

University of Chicago
B.S. in Mathematics (Honors; Phi Beta Kappa, Sigma Xi), — June 2007

Professional Experience

University of Minnesota - Twin Cities, School of Statistics
Associate Professor — August 2020–Present
Assistant Professor — August 2013–July 2020
Director of Undergraduate Studies — August 2020 – August 2021

Federal Reserve Bank, Chicago
Associate Economist — June 2007-July 2008

Published or Accepted Papers

Doss, C. R., and McFowland III, E. (2022) Non-parametric subset scanning for detection of heteroscedasticity. *The Journal of Computational and Graphical Statistics.* **31**(3), 813–823.

Balabdaoui, F. **Doss, C. R.**, and Durot, C. (2021) Unlinked monotone regression. *The Journal of Machine Learning Research.* **22**(172).

Molstad, A. J., Weng, G., **Doss, C.R.**, and Rothman, A. J. (2021) An explicit mean-covariance parameterization for multivariate response linear regression. *The Journal of Computational and Graphical Statistics.* **30**(3), 612–621.

Doss, C. R. (2020) Bracketing numbers of convex and m-monotone functions on polytopes. *The Journal of Approximation Theory.* **256**, 105425.

Doss, C. R. and Wellner J. A. (2019). Univariate log-concave density estimation with symmetry or modal constraints. *The Electronic Journal of Statistics*, **13**(2), 2391–2461.

Doss, C. R. and Wellner J. A. (2019). Inference for the mode of a log-concave density. *The Annals of Statistics*, **47**(5), 2950–2976.

Doss, C. R. (2018). Concave regression: value-constrained estimation and likelihood ratio-based inference. *Mathematical Programming.* **174**(1-2), 5–39.

Doss, C. R. and Weng, G. (2018). Bandwidth selection for kernel density estimators of multivariate level sets and highest density regions. *The Electronic Journal of Statistics*, **12**:4313-4376.

Balabdaoui, F. and **Doss, C. R.** (2018) Inference for a mixture of symmetric distributions under log-concavity. *Bernoulli*, **24**(2):1053–1071.

Doss, C. R. and Wellner J. A. (2016) Global rates of convergence of the MLEs of log-concave and s-concave densities. *The Annals of Statistics*, **44**:954–981.

Doss, C.R., Flegal, J. M., Jones, G.L. and Neath R. C. (2014). Markov chain Monte Carlo estimation of quantiles. *The Electronic Journal of Statistics,* **8**:2448-2478.

Doss, C. R., Suchard, M. A., Holmes, I., Kato-Maeda, M., and Minin, V. N.. (2013). Fitting birth-death processes to panel data with applications to bacterial DNA fingerprinting. *The Annals of Applied Statistics.* **7**:2315-2335.

Interdisciplinary/Application publications:

Griffing, D., Larson, S., Hollander, J., Christiansen, J., and **Doss, C. R.** (2014). Observations on abundance of bluntnose sixgill sharks, Hexanchus griseus, in an urban waterway in Puget Sound, 2003-2005. *PloS one* 9.1: e87081.

Submitted Papers

Albrecht, T. A., **Doss, C. R.**, and Nachtsheim, C. J. Efficient discrete choice experimental design using a tournament framework. Resubmitted to *The Journal of the American Statistical Association (T&M).*

Weng, G., **Doss, C. R.**, Wang, L., Moscovice, I., and Chantarat, T. A nonparametric doubly robust test for a continuous treatment effect. Revising for *The Annals of Statistics.*

Preprints

Doss, C. R. and Jankowski, H. Estimating a strongly log-concave density and adaptation to Gaussianity.

Ye, Chenglong and **Doss, C. R.** Minimax convergence rates for estimation of multivariate s-concave densities.

Doss, C. R. and Geyer, C. J. On the asymptotics of convex stochastic optimization.

Doss, C.R. Doubly robust pointwise confidence intervals for a monotonic continuous treatment effect curve.

Funding & Awards

- NSF DMS-2210312 grant (sole PI) July 2022—June 2025
- University of Minnesota (College of Liberal Arts) Warwick Mid-Career Faculty Research Award Mar 2022–Dec 2023
- Minnesota Dept. of Health grant June 2021–Dec 2021
  Monitoring of COVID-19 through wastewater-based epidemiology. I received funding for $> 25\%$ salary and for 2 RA's for June 2021–present
- NSF DMS-1712664 grant (sole PI) July 2017—June 2020
- University of Minnesota, Grant-in-Aid ($35,702) 2016–17

Invited Talks

Nonparametric doubly robust testing for continuous treatment effects via smoothness and via shape constraints, August 2022, JSM, Washington D.C.

(Cancelled due to COVID) *A nonparametric doubly robust test for a continuous treatment effect*, May 2022, Robustness and Resilience in Stochastic Optimization and Statistical Learning, Erice, Italy.

A nonparametric doubly robust test for a continuous treatment effect, April 2022, University of Massachusetts (Amherst) Statistics, Amherst, MA.

A nonparametric doubly robust test for a continuous treatment effect, Mar 2022, Columbia Statistics, New York, NY.

Discussion of "Optimal Subgroup Selection" presented by Richard J. Samworth, Jan 2022, International Seminar on Selective Inference (virtual/online).

A nonparametric doubly robust test for a continuous treatment effect, December 2021, ERCIM/CMStatistics, London, United Kingdom.

Discussion of "Recent advances in unlinked and permuted regression", August 2021, JSM (virtual).

Unlinked monotone regression, October 2020, George Mason University Statistics Seminar, (virtual) Fairfax, VA.

In 2020 two invited talks were canceled due to COVID-19 and travel difficulties.

Unlinked monotone regression, Aug 2020, JSM 2020, Philadelphia, PA. (Virtual due to COVID-19).

Likelihood ratio tests and confidence intervals based on the shape constraint of concavity, Dec 2019, ERCIM/CMStatistics, London, United Kingdom.

Likelihood ratio tests and confidence intervals based on the shape constraint of concavity, Nov 2019, Duke University Statistical Science Seminar, Durham, NC.

Likelihood ratio tests and confidence intervals based on the shape constraint of concavity, May 2018, 2018 IISA International Conference on Statistics, Gainesville, FL.

Bandwidth selection for kernel density estimators of multivariate level sets and highest density regions, Feb 2018, Data Science Seminar, Institute for Mathematics and its Applications, University of Minnesota.

Bandwidth selection for kernel density estimators of multivariate level sets and highest density regions, Jan 2018, Shape-Constrained Methods: Inference, Applications, and Practice. Banff, Canada.

Estimation and Computation of Log-Concave Densities, May 2017, SIAM Conference on Optimization. Vancouver, Canada.

Inference for a Mixture of Symmetric Distributions under Log-Concavity, March 2017, University of Minnesota Statistics Department Seminar. Minneapolis, MN.

Inference for a Mixture of Symmetric Distributions under Log-Concavity, June 2016, International Workshop on Applied Probability. Toronto, Canada.

Inference for a Mixture of Symmetric Distributions under Log-Concavity, March 2016, Colorado State University Statistics Seminar. Fort Collins, CO.

Nonparametric Inference about a Density's Mode via the Log-Concave Shape Constraint, January 2016, University of Minnesota Student Seminar. Minneapolis, MN.

Shape-constrained Inference for the Argmax of a Concave Function, December 2015, ERCIM/CMStatistics. London, United Kingdom.

A Likelihood Ratio Test for the Mode of a Log-Concave Density, November 2015,

University of Michigan Seminar. Ann Arbor, MI.

A Likelihood Ratio Test for the Location of the Maximum of a Concave Function, October 2015, Shape Constrained Inference: Open Problems and New Directions, Leiden, Netherlands.

Symmetric Log-Concave Density Estimation and Mixture Modeling, August 2015, Joint Statistical Meetings, Seattle, Washington.

A Likelihood Ratio Test for the Location of the Maximum of a Concave Function, July 2015, European Meeting of Statisticians, Amsterdam, Netherlands.

Nonparametric Inference about a Density's Mode and Shape Constraints, August 2014, Joint Statistical Meetings, Boston, USA.

Log-Concavity and Nonparametric Inference about a Density's Mode, August 2014, IMS New Researcher's Conference, Boston, USA.

Semiparametric Modeling with Log-Concave Densities, May 2014, Statistical Society of Canada Annual Meeting, Toronto, Canada.

Nonparametric Mode Estimation via the Log-Concave Shape Constraint, October 2011, U. Heidelberg Applied Math Dept., Heidelberg, Germany.

Courses Taught

Theory of Statistics I (STAT 4101)	Fall 2013–15, 2017
Theory of Statistics II (STAT 4102)	Spring 2014–17, Fall 2018–19
Ph.D. Asymptotics (STAT 8112)	Spring 2016–19
Time Series Analysis (STAT 5511)	Spring 2018–21, Fall 2021
Ph.D. Literature Seminar (STAT 8913)	Fall 2019
Theory of Statistics I (STAT 5101)	Spring 2021, Fall 2021

Supervising

Ph.D. Thesis Advisor:

- Guangwei Weng

Ph.D. Thesis Committee Member:

- Yang Song
- Evan Olawsky
- Sanhita Sengupta
- Wenjun Lang
- Jiawei Jiang
- Ning Dai
- Ming Gao
- June Park (Mathematics)
- Daniel Eck (graduated 2017)
- Patrick Schnell (Biostatistics, graduated 2017)
- Megan Heyman (graduated 2016)
- Felipe Acosta Archila (graduated 2015)

Master's thesis ("Plan B") Supervisor:

- Difan Ouyang (2020–present)
- Sirui Liu (2020–present)
- Zachary Gunderson (2018)
- Jiuwu Jiu (2016)
- Qimeng Chen (2015)

Master's thesis ("Plan B") Committee Member:

- Yi Rong
- Patrick Skoglund
- Rihan Chen (2016)
- Jingxiang Li (2016)
- Jing Yang (2015)

Departmental Service

Seminar Coordinator, U. Minnesota — Fall 2014

PhD Exam Committee, U. Minnesota — 2013–16, 17–19

- Chair — 2015–16, 17–18

Fellowships Committee — 2016-17

Admissions Committee — 2017–18

Hiring Committee — 2018–19

Student Recruiting, Retention, and Support (Diversity, Equity, and Inclusion) Committee — 2020–21

- Chair — 2020–21

Director of Undergraduate Studies — Aug 2020–Aug 2021

Subcommittee Member

- MS Curriculum subcommittee, U. Minnesota — Fall 2013
- Undergraduate Curriculum subcommittee, U. Minnesota — Fall 2014
- Subcommittee on SLOs, U. Minnesota — Spring 2016
- Curriculum subcommittee (PhD Exams), U. Minnesota — Spring 2017
- Reforming Ph.D. exam subcommittee, U. Minnesota — Fall 2018
- Three year plan subcommittee for undergraduate education, U. Minnesota Fall 2021

Webmaster, U. Washington — September 2010–March 2012

College & University Service

U. Minn. CLA Faculty Research Awards Committee — 2016–19

U. Minn. CLA General Assembly — 2017-19

Professional Service

Associate Editor, The Electronic Journal of Statistics — 2022–present

Associate Editor, The American Statistician — 2020–present

Organizer, UMN Statistics presence at recruiting events — 2019–20

Organized UMN presence and attended (virtual, due to COVID) recruiting several national events aimed at increasing the presence of different underrepresented students in UMN Statistics

Organizer, Machine Learning Summer School Day Camp 2019–
All-girls week-long session and all-gender week-long session

Ad-hoc Committee forming the IMS New Researchers Group 2014–15

Committee member, IMS New Researchers Group 2015–16

Organizer, "Statistics day" (for local high schoolers) 2009

Served as Referee for:
The American Statistician
Annals of Statistics
Journal of the American Statistical Association
Bernoulli
Bulletin of the Malaysian Mathematical Sciences Society
Communications in Statistics
Conference on Learning Theory (COLT)
Electronic Journal of Statistics
IEEE Conference on Data Science
Information and Inference
Journal of Nonparametric Statistics
Mathematical Programming,
Sankhya, the Indian Journal of Statistics (Series A)
Scandinavian Journal of Statistics
SIAM Journal on Optimization
Statistics and Data Mining
Statistical Science
Statistica Sinica
Journal of Statistical Planning and Inference
Statistics and Probability Letters.

Served as ad-hoc reviewer for NSF MMS submission

Software

DOBAD R Package (maintained by me)

logcondens.mode R Package (maintained by me)

lsbs R package (maintained by Guangwei Weng)

UMR R package (maintained by me)

DRDRtest R package (maintained by Guangwei Weng)

HSS R package

DCDesign R package (`https://github.com/taalbrecht/DCDesign`, maintained by Thomas Albrecht)