

OSCAR HERNAN MADRID PADILLA

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EMPLOYMENT Assistant Professor
University of California, Los Angeles July 2019 - - present

Neyman Visiting Assistant Professor
University of California–Berkeley July 2017–June 2019

EDUCATION Ph.D., Statistics, The University of Texas at Austin 2013 - - May 2017
Advisor: James G. Scott
Bachelor in Mathematics, Universidad de Guanajuato 2009-2013

RESEARCH INTERESTS Network estimation problems, sequential analysis, graphical models, nonparametric statistics, and Bayesian statistics.

PUBLICATIONS “Quantile regression with ReLU Networks: Estimators and minimax rates.” **Oscar-Hernan Madrid-Padilla**, Wesley Tansey, and Yanzhen Chen.
To appear in Journal of Machine Learning Research.

“Extensions to the Proximal Distance of Method of Constrained Optimization.” Alfonso Landeros, **Oscar-Hernan Madrid-Padilla**, Hua Zhou, and Kenneth Lange.
To appear in Journal of Machine Learning Research.

“A naturalistic study of brushing patterns using powered toothbrushes.” Mahmoud Essalat, Douglas Morrison, Sumukh Kak, E. Chang, Isabel Penso, Roig Kulchar, **Oscar-Hernan Madrid-Padilla**, Vivek Shetty.
PLoS One. 2022 May 19;17(5):e0263638.

“Denoising and change point localisation in piecewise-constant high-dimensional regression coefficients.” Fan Wang, **Oscar-Hernan Madrid-Padilla**, Yi Yu, and Alessandro Rinaldo.
Proceedings of The 25th International Conference on Artificial Intelligence and Statistics, PMLR 151:4309-4338. (Oral presentation, in the top 44 out of 1685 submissions).

“Optimal partition recovery in general graphs.” Yi Yu, **Oscar-Hernan Madrid-Padilla**, and Alessandro Rinaldo.
Proceedings of The 25th International Conference on Artificial Intelligence and Statistics, PMLR 151:4339-4358.

“Risk Bounds for Quantile Trend Filtering.” **Oscar-Hernan Madrid-Padilla**, and Sabyasachi Chatterjee.
To appear in Biometrika.

“Graphon estimation via nearest neighbor algorithm and 2D fused lasso denoising”
Oscar-Hernan Madrid-Padilla, Yanzhen Chen.
Canadian Journal of Statistics. In press.

“Optimal post-selection inference for sparse signals: a nonparametric empirical-Bayes approach.” Spencer Woody, **Oscar-Hernan Madrid-Padilla**, and James G. Scott.
Biometrika, Volume 109, Issue 1, March 2022, Pages 1–16.

“Optimal nonparametric multivariate change point detection and localization.” **Oscar-Hernan Madrid-Padilla**, Yi Yu, Daren Wang, Alessandro Rinaldo.
IEEE Transactions on Information Theory, Volume: 68, Issue: 3, March 2022.

“Lattice partition recovery with dyadic CART.” **Oscar-Hernan Madrid-Padilla**, Yi Yu, and Alessandro Rinaldo.
34th Conference on Neural Information Processing Systems. 2021.

“Non-Parametric Quantile Regression via the K-NN Fused Lasso.” Steven Ye, **Oscar-Hernan Madrid-Padilla**.
Journal of Machine Learning Research, Vol. 22, No. 111, 1-38, 2021.

“Optimal nonparametric change point detection and localization.” **Oscar-Hernan Madrid-Padilla**, Yi Yu, Daren Wang, Alessandro Rinaldo.
Electronic Journal of Statistics. 15 (1) 1154 - 1201, 2021.

“Adaptive Non-Parametric Regression With the K-NN Fused Lasso.” **Oscar-Hernan Madrid-Padilla**, James Sharpnack, Yanzhen Chen, and Daniela Witten.
Biometrika, Volume 107, Issue 2, June 2020, Pages 293–310.

“Sequential nonparametric tests for a change in distribution: an application to large-scale radiological survey.” **Oscar-Hernan Madrid-Padilla**, Alex Athey, Reinhart, and James G. Scott. *Journal of the American Statistical Association, Vol. 114, Issue 526, 514-528, 2019.*

“The DFS Fused Lasso: Linear-Time Denoising over General Graphs.” **Oscar-Hernan Madrid-Padilla**, James Sharpnack, James G. Scott, and Ryan Tibshirani.
Journal of Machine Learning Research, Vol. 18, No. 176, 1-36, 2018.

“A deconvolution path to mixtures.” **Oscar-Hernan Madrid-Padilla**, Nicholas Polson, and James G. Scott. *Electronic Journal of Statistics Volume 12, Number 1 (2018), 1717-1751.*

“Worst case portfolios of dynamic monetary utility functions.” Daniel Hernandez Hernandez, **Oscar-Hernan Madrid-Padilla**. *Stochastics, Vol. 90, Number 1 (2018).*

“Tensor decomposition with generalized lasso penalties.” **Oscar-Hernan Madrid-Padilla**, James G. Scott. *Journal of Computational and Graphical Statistics 2017, 26:3, 537-546.*

PAPERS
UNDER
REVIEW

“Priors for Random Count Matrices Derived from a Family of Negative Binomial Processes.” Mingyuan Zhou, **Oscar-Hernan Madrid-Padilla**, and James G. Scott. *Journal of the American Statistical Association* 2016, Vol. 111, No. 515, 1144-1156, *Theory and Methods*.

“Vector-space markov random fields via exponential families.” Wesley Tansey, **Oscar-Hernan Madrid-Padilla**, Arun Sai Suggala, Pradeep Ravikumar. *Proceedings of the The 32nd International Conference on Machine Learning*. 2015.

“Dynamic and heterogeneous treatment effects with abrupt changes.” **Oscar-Hernan Madrid-Padilla**, Yi Yu. <https://arxiv.org/pdf/2206.09092.pdf> 2022.

“A Partially Separable Temporal Model for Dynamic Valued Networks.” Yik Lun Kei, Yanzhen Chen, **Oscar-Hernan Madrid-Padilla**. <https://arxiv.org/abs/2205.13651> 2022.

“Sequential Learning of the Topological Ordering for the Linear Non-Gaussian Acyclic Model with Parametric Noise.” G. Ruiz, **Oscar-Hernan Madrid-Padilla**, Q. Zhou. <https://arxiv.org/pdf/2202.01748.pdf> 2022.

“Quantile Regression by Dyadic CART. ” **Oscar-Hernan Madrid-Padilla**, and Sabyasachi Chatterjee. <https://arxiv.org/pdf/2110.08665.pdf>. 2021.

“Non-parametric interpretable score based estimation of heterogeneous treatment effects.” Steven Ye, and **Oscar-Hernan Madrid-Padilla**. <https://arxiv.org/pdf/2110.02401.pdf> 2021.

“A causal fused lasso for interpretable heterogeneous treatment effects estimation.” **Oscar-Hernan Madrid-Padilla**, Yanzhen Chen, Gabriel Ruiz. <https://arxiv.org/pdf/2110.00901.pdf>. 2021.

“Learning Gaussian DAGs from Network Data.” Hangjian Li, **Oscar-Hernan Madrid-Padilla**, Qing Zhou. <https://arxiv.org/pdf/1905.10848.pdf>. 2021.

“Scalable Bayesian change point detection with spike and slab priors.” Lorenzo Cappello, **Oscar-Hernan Madrid-Padilla**, and Julia A. Palacios. <https://arxiv.org/pdf/2106.10383.pdf>. 2021.

“Optimal network online change point localisation.” Yi Yu, **Oscar-Hernan Madrid-Padilla**, Daren Wang, and Alessandro Rinaldo. <https://arxiv.org/pdf/2101.05477.pdf>. 2021.

“A Note on Online Change Point Detection” Yi Yu, **Oscar-Hernan Madrid-Padilla**, and Alessandro Rinaldo. <https://arxiv.org/pdf/2006.03283.pdf>. 2020.

“High Dimensional Latent Panel Quantile Regression with an Application to Asset Pricing.” Alexandre Belloni, Mingli Chen, **Oscar-Hernan Madrid-Padilla**, Zixuan (Kevin) Wang. (Alphabetical order). <https://arxiv.org/pdf/1912.02151.pdf>. 2019.

“Energy distance and kernel mean embeddings for two-sample survival testing.” Marcos Matabuena, and **Oscar-Hernan Madrid-Padilla**.
<https://arxiv.org/pdf/1912.04160.pdf>. 2019.

“Change point localization in dependent dynamic nonparametric random dot product graphs.” **Oscar-Hernan Madrid-Padilla**, Yi Yu, and Carey E. Priebe.
<https://arxiv.org/pdf/1911.07494.pdf>. 2019.

“Distributed Cartesian Power Graph Segmentation for Graphon Estimation.” Shitong Wei, **Oscar-Hernan Madrid-Padilla**, and James Sharpnack.
<https://arxiv.org/abs/1805.09978>. 2018.

“Nonparametric density estimation by histogram trend filtering.” **Oscar-Hernan Madrid-Padilla**, James G. Scott. <http://arxiv.org/abs/1509.04348>. 2015.

TEACHING

Instructor, at University of California, Los Angeles:

- Linear Models (100C) Lecture 1, Spring 2022.
My Instructor Rating: 7.76 out of 9 (average), 8.0 out of 9 (median)
Response Rate = 77.78%
Class size: 27.
- Introduction to Mathematical Statistics (100B) Lecture 2, Winter 2022.
My Instructor Rating: 7.78 out of 9 (average), 8.0 out of 9 (median)
Response Rate = 64.29%
Class size: 42.
- Introduction to Mathematical Statistics (100B) Lecture 1, Winter 2022.
My Instructor Rating: 7.27 out of 9 (average), 8.0 out of 9 (median)
Response Rate = 84.09%
Class size: 44.
- Introduction to Probability (100A), Spring 2021.
My Instructor Rating: 6.65 out of 9 (average), 7.0 out of 9 (median)
Response Rate = 47.69%
Class size: 65.
- Introduction to Mathematical Statistics (100B), Winter 2021.
My Instructor Rating: 6.81 out of 9 (average), 7.0 out of 9 (median)
Response Rate = 31.4%
Class size: 70.
- Introduction to Mathematical Statistics (100B), Winter 2021.
My Instructor Rating: 6.79 out of 9 (average), 7.0 out of 9 (median)
Response Rate = 28.8%
Class size: 65.

- Introduction to Mathematical Statistics (100B), Winter 2020.
My Instructor Rating: 7.19 out of 9 (average), 8.0 out of 9 (median)
Response Rate = 77.14%
Class size: 35.
- Matrix algebra and optimization (202B), Winter 2020.
My Instructor Rating: 6.96 out of 9 (average), 7.0 out of 9 (median)
Response Rate = 83.87%
Class size: 31.

Instructor, at University of California, Berkeley:

- Linear Models, Fall 2017.
My Instructor Rating: 5.6 out of 7.
Department Average Rating : 5.0 out of 7.
Class size: 71.
- Game Theory, Spring 2018.
My Instructor Rating: 5.5 out of 7.
Department Average Rating : 5.3 out of 7.
Class size: 62.
- Linear Models, Fall 2018.
My Instructor Rating: 5.9 out of 7.
Department Average Rating : 5.3 out of 7.
Class size: 100.
- Linear Models, Spring 2019.
My Instructor Rating: 5.5 out of 7.
Department Average Rating : 5.1 out of 7.
Class size: 86.

Teaching Assistant, at The University of Texas at Austin, for the following courses:

Introduction to Probability and Statistics.
Time Series.
Bayesian Statistics.
Statistical Modeling.
Experiments Design.
Statistics and Market Analysis.
Statistical models for big data.

Teaching Assistant, at The Universidad de Guanajuato, for:

Measure Theory.
Advanced Probability.
Calculus.
Real Analysis.
Topology.

Mathematics instructor for high school students in Guanajuato, Mexico, 2011-2013.

AWARDS

- UCLA 2022-23 Faculty Career Development Award. Total amount: \$11,500.
- DMS-EPSRC: Change-Point Detection and Localization in High Dimensions: Theory and Methods. Alessandro Rinaldo (PI), **Oscar Hernan Madrid Padilla** (Co-PI). Total amount: \$280,000.00.
- Dissertation Fellowship, The University of Texas at Austin. Spring 2017.
- Graduate School Fellowship, The University of Texas at Austin. Summer 2016.
- Bonus Fellowship for Continuing Students, The University of Texas at Austin. 2015.
- Research assistant scholarship, CIMAT. 2012-2013.
- Best grades average of the bachelor degree in Mathematics, Universidad de Guanajuato. 2011-2012.
- Excellence Scholarship, Mathematical Research Center (CIMAT, Mexico). 2009-2013.
- Fourth absolute place at the Fermat Mathematical Contest, Mexico 2008.
- Honorable mention, Ibero-American Mathematical Olympiad. 2009.
- Honorable mention, International Mathematical Olympiad. 2008.

TALKS

- Change point localization in dependent dynamic nonparametric random dot product graphs. 2022 EcoSta Conference. June 2022.
- Recent developments in nonparametric quantile regression. Statistics Seminar, UCLA. March 2022.
- Quantile Regression with Total Variation Based Methods. 2022 SIAM Conference on Imaging Science. March 2022.
- Risk bounds in nonparametric quantile regression. CIMAT (Mexico). November 2021.
- Learning Gaussian DAGs from Network Data. Seminar talk at Department of Statistics, University of California, Santa Cruz. October, 2021.
- Learning Gaussian DAGs from Network Data. Seminar talk at Department of Biostatistics, The University of North Carolina at Chapel Hill. October, 2021.
- Some recent results on quantile regression. Seminar talk at Marshall Business School, University of Southern California. August 2021.
- Risk bounds for quantile trend filtering. Joint Statistical Meeting 2021. August 2021.
- Change point localization in dependent dynamic nonparametric random dot product graphs. WNAR 2021 meeting. June 2021.
- Quantile trend filtering. CMStatistics 2020. December 2020.
- Optimal post-selection inference for sparse signals: a nonparametric empirical-Bayes approach. International Seminar on Selective Inference. November 2020.

- Quantile regression with ReLU Networks: Estimators and minimax rates. Cibercoloquio Latinoamericano de Matemáticas. November 2020.
- Optimal post-selection inference for sparse signals: a nonparametric empirical-Bayes approach. Biostatistics Seminar, UCLA. November 2020.
- High Dimensional Latent Panel Quantile Regression with an Application to Asset Pricing. CMStatistics 2019. December 2019.
- Nonparametric change point problems. SACNAS 2019. October 2019.
- Fused lasso in graph estimation problems. Statistics seminar. Department of Statistics & Actuarial science, The University of Hong Kong. September 2019.
- Fused lasso in graph estimation problems. Research presentation. Department of Mathematics, University of Arizona. February 2019.
- Sequential nonparametric tests for a change in distribution: an application to detecting radiological anomalies. Research presentation. Biostatistics Department, University of Michigan. February 2019.
- Fused lasso in graph estimation problems. Research presentation. Marshall Business School, University of Southern California. February 2019.
- Sequential nonparametric tests for a change in distribution: an application to detecting radiological anomalies. Research presentation. Business School, Hong Kong University of Science and Technology. January 2019.
- Sequential nonparametric tests for a change in distribution: an application to detecting radiological anomalies. Research presentation. College of Business, City University of Hong Kong. January 2019.
- Sequential nonparametric tests for a change in distribution: an application to detecting radiological anomalies. Research presentation. Department of Statistics, Virginia Institute of Technology. January 2019.
- Fused lasso in graph estimation problems. Research presentation. Department of Statistics, Pennsylvania State University. January 2019.
- Fused lasso in graph estimation problems. Research presentation. Department of Pure Mathematics and Mathematical Statistics, University of Cambridge. January 2019.
- Fused lasso in graph estimation problems. Research presentation. Department of Mathematics & Statistics, Boston University. January 2019.
- Fused lasso in graph estimation problems. Research presentation. Department of Statistics and Applied Probability, University of California, Santa Barbara. January 2019.
- Sequential nonparametric tests for a change in distribution: an application to detecting radiological anomalies. Research presentation. School of Mathematical and Statistical Sciences, Arizona State University. January 2019.
- Fused lasso in graph estimation problems. Research presentation. Department of Statistics, University of California, Irvine. January 2019.
- Fused lasso in graph estimation problems. Research presentation. Department of Mathematics, University of Houston. December 2018.
- Fused lasso in graph estimation problems. Research presentation. Department of Statistics, North Carolina State University. December 2018.
- Fused lasso in graph estimation problems. Research presentation. Department of Statistics, University of California, Los Angeles. December 2018.

- Fused lasso in graph estimation problems. Research presentation. Department of Statistics, Texas A&M. November 2018.
- Fused lasso in graph estimation problems. Seminar. Department of Statistics, University of California, Davis. November 2018.
- The DFS Fussed Lasso: Linear Time Denoising over General Graphs. Biostat Seminar. University of California, Berkeley. March 2018.
- The DFS Fussed Lasso: Linear Time Denoising over General Graphs. Yu Group. University of California, Berkeley. November 2017.
- The DFS Fussed Lasso: Linear Time Denoising over General Graphs. SLAB LAB SEMINAR. University of Washington. March 2017.
- The DFS Fussed Lasso: Linear Time Denoising over General Graphs. STATISTICS SEMINAR. The Department of Statistical Science, Cornell University. February 2017.
- The DFS Fussed Lasso: Linear Time Denoising over General Graphs. SEMINAR SERIES. Department of Statistics and Data Sciences, The University of Texas at Austin. October 2016.
- Worst case portfolios of dynamic monetary utility functions. XLV Congress of the Mexican Mathematical Society. 2012.

Editorial service **Associate Editor for Stat.**

Reviewer for:

- Journal of the American Statistical Association (JASA)
- Annals of Statistics
- Biometrika
- Journal of the Royal Statistical Society Series B
- Journal of Machine Learning Research
- Annals of Applied Statistics
- IEEE Transactions on Signal Processing
- Journal of Computational and Graphical Statistics
- Statistics in Medicine
- Biometrics
- Electronic Journal of Statistics
- Statistica Sinica
- IEEE Transactions on Signal and Information Processing over Networks
- Journal of Applied Statistics
- TEST
- The Journal of Supercomputing
- Technometrics
- IEEE Transactions on Systems, Man and Cybernetics: Systems
- AISTATS
- SIAM Journal on Mathematics of Data Science (SIMODS)
- Computational Statistics & Data Analysis

- Journal of Business & Economic Statistics
- Mathematical Finance

Professional service

- Judge for the 12th annual ASA DataFest at UCLA. May 2022.
- Member of Committee for the Evaluation of the PhD Written Qualifying Exam papers. UCLA PhD in Statistics program. 2021–present.
- Reviewer for the Methodology, Measurement, and Statistics (MMS) Program at the U.S. National Science Foundation (NSF). 2022.
- Reviewer for Research Grants Council (RGC) of Hong Kong, March 2022.
- **Top reviewer** distinction, AISTATS 2022.
- Reviewer for National Research and Development Agency (ANID) of the Ministry of Science, Technology, Knowledge and Innovation of Chile. 2021.
- Reviewer for Research Grants Council (RGC) of Hong Kong, 2021.
- Committee member for the 2021 Statistical Learning and Data Science Section (SLDS) of the American Statistical Association student paper competition. December 2021.
- Reviewer for the 2020 Section on Bayesian Statistical Science (SBSS) of the American Statistical Association student paper competition. December 2020.
- Session chair at CMStatistics 2019. London, December 2019.
- *Judge for* the third annual Berkeley statistics DataFest on April 13-15, 2018.

Advising

- Bill Li, Statistics Master, UCLA, 2022-present.
- Steven Ye, Statistics PhD, UCLA, 2019-present.
- Yik Lun Kei, Statistics PhD, UCLA, 2021-present.
- Gabriel Ruiz, Statistics PhD, UCLA, 2017-present (co-advising).

Serving/Served on the following Ph.D. thesis committees:

- Mahmoud Essalat, Electrical & Computer Engineering, UCLA.
- Vincent Bojie Liu, Statistics PhD, UCLA.
- Dale Kim, Statistics PhD, UCLA. Graduated on June 2022.
- Hangjian Li, Statistics PhD, UCLA. Graduated on August 2021.
- Qiaoling Ye, Statistics PhD, UCLA. Graduated on August 2021.

Serving/Served on the following Master thesis committees:

- Brayden Nicholl, MAS program, UCLA. 2022- present.
- Gurami Kavrelishvili, MAS program, UCLA. 2022-present.