

# 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** “Optimal nonparametric multivariate change point detection and localization.” **Oscar-Hernan Madrid-Padilla**, Yi Yu, Daren Wang, Alessandro Rinaldo.  
*To appear in IEEE Transactions on Information Theory.*

“Lattice partition recovery with dyadic CART.” **Oscar-Hernan Madrid-Padilla**, Yi Yu, and Alessandro Rinaldo.  
*To appear in NeurIPS.* 2021.

“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*, 2021;, asab014, <https://doi.org/10.1093/biomet/asab014> .

“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.

“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.

**PAPERS  
UNDER  
REVIEW**

“Denoising and change point localisation in piecewise-constant high-dimensional regression coefficients.” Fan Wang, **Oscar-Hernan Madrid-Padilla**, Yi Yu, and Alessandro Rinaldo. <https://arxiv.org/pdf/2110.14298.pdf>. 2021.

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

“Optimal partition recovery in general graphs.” Yi Yu, **Oscar-Hernan Madrid-Padilla**, and Alessandro Rinaldo. <https://arxiv.org/pdf/2110.10989.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**, Peng Ding, 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.

“Quantile regression with ReLU Networks: Estimators and minimax rates.” **Oscar-Hernan Madrid-Padilla**, Wesley Tansey, and Yanzhen Chen. <https://arxiv.org/pdf/2010.08236.pdf>. 2020.

“Extensions to the Proximal Distance of Method of Constrained Optimization.” Alfonso Landeros, **Oscar-Hernan Madrid-Padilla**, Hua Zhou, and Kenneth Lange. <https://arxiv.org/pdf/2009.00801.pdf>. 2020.

“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:

- 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

- 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

- 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 Fused Lasso: Linear Time Denoising over General Graphs. Biostat Seminar. University of California, Berkeley. March 2018.
- The DFS Fused Lasso: Linear Time Denoising over General Graphs. Yu Group. University of California, Berkeley. November 2017.
- The DFS Fused Lasso: Linear Time Denoising over General Graphs. SLAB LAB SEMINAR. University of Washington. March 2017.
- The DFS Fused Lasso: Linear Time Denoising over General Graphs. STATISTICS SEMINAR. The Department of Statistical Science, Cornell University. February 2017.
- The DFS Fused 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    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

**Professional service**

- 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.
- Reviewer for the 2020 SBSS 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**

- 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.
- Hangjian Li, Statistics PhD, UCLA.
- Qiaoling Ye, Statistics PhD, UCLA, Graduated on August 2021.