Karl Rohe

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Education	PH.D., UNIVERSITY OF CALIFORNIA, BERKELEY, STATISTICS. May 2011 Designated Emphasis in Communication, Computation, and Statistics. Thesis: "Analysis of Spectral Clustering and the Lasso under Nonstandard Statistical Models"
	B.S., MICHIGAN STATE UNIVERSITY, STATISTICS. May 2006. *Summa cum laude.* Minor in Environmental Economics. *Study Abroad*: Argentina; Switzerland; China; and Netherlands, France, and Spain.
Positions	ASSOCIATE PROFESSOR WITH TENURE, Department of Statistics, University of Wisconsin-Madison. Sept 2017 - Present. AFFILIATE FACULTY, School of Journalism and Mass Communication, University of Wisconsin-Madison, Fall 2018 - Present. AFFILIATE FACULTY, Department of Electrical and Computer Engineering, University of Wisconsin-Madison, Spring 2015 - Present. ASSISTANT PROFESSOR, Department of Statistics, University of Wisconsin-Madison. Sept 2011 - Sept 2017.
Editorial Service	ASSOCIATE EDITOR: Science Advances (Starting Jan 2019) Journal of the Royal Statistical Society: Series B (JRSS-B) and Journal of Nonparametric Statistics (JNPS)
Awards	HEWLETT FOUNDATION (CO-I) Communication Ecologies, Political Contention, and the Crisis of Democracy (150k / 2 years / fall 2018 - fall 2020). Katherine Cramer (PI), Lew Friedland, Karl Rohe, William Sethares, Dhavan Shah, Michael Wagner and Chris Wells.

Vice Chancellor for Research and Graduate Education (CO-I) UW2020 Program. Communication Ecologies, Political Contention, and the Crisis of Democracy. (411k / 2 years / summer 2018 - summer 2020). Lew Friedland (PI), Katherine Cramer, Karl Rohe, William Sethares, Dhavan Shah, Michael Wagner and Chris Wells.

National Science Foundation - Division of Mathematical Sciences. With additional support from NSF-MMS and other Federal Statistical Agencies. A spectral framework for network driven sampling. Grant number DMS-1612456 (172k / 3 years / summer 2016 - summer 2019). PI, Sole Investigator.

Army Research Office. A spectral framework for multi-resolution graph sampling and clustering (520k / 4 years / summer 2015 - summer 2019). PI, Sole Investigator.

National Science Foundation - Division of Mathematical Sciences. Spectral Methods for Contextualizing relational data. Grant number DMS-1309998 (120k / 3 years / summer 2013 - summer 2016). PI.

UW Graduate School fall research competition June 2012, 2013, 2015, 2018

Evelyn Fix Memorial Medal and Citation, awarded to the PhD student on the Berkeley campus showing the greatest promise in statistical research, with preference for applications to biology and problems of health. (2011)

National Science Foundation Funded Research Experience for Undergraduates in China. (Summer 2005)

Lumsden-Valrance Scholarship (Fall 2004 - Spring 2006)

L.C. Plant Merit Award (Spring 2006)

Publications

[1] Karl Rohe. Network driven sampling; a critical threshold for design effects. *Accepted at Annals of Statistics.*

[2] Karl Rohe, Jun Tao, Xintian Han, and Norbert Binkiewicz. A note on quickly sampling a sparse matrix with low rank expectation. *Journal of Machine Learning Research*, 2018.

[3] Yilin Zhang and Karl Rohe. Understanding regularized spectral clustering via graph conductance. *Accepted at Neural Information Processing Systems (NeurIPS)*, 2018.

[4] Sebastien Roch and Karl Rohe. Generalized least squares can overcome the critical threshold in respondent-driven sampling. *Proceedings of the National Academy of Sciences*, 2018.

[5] Yilin Zhang, Marie Poux-Berthe, Chris Wells, Karolina Koc-Michalska, Karl Rohe, et al. Discovering political topics in facebook discussion threads with graph contextualization. *The Annals of Applied Statistics*, 12(2):1096–1123, 2018.

[6] Juhee Cho, Donggyu Kim, and Karl Rohe. Intelligent initialization and adaptive thresholding for iterative matrix completion; some statistical and algorithmic theory for adaptive-impute. *Accepted at Journal of Computational and Graphical Statistics*.

[7] Mohammad Khabbazian, Bret Hanlon, Zoe Russek, and Karl Rohe. Novel sampling design for respondent-driven sampling. *Accepted in Electronic Journal of Statistics*, 2016.

[8] Xiao Li and Karl Rohe. Central limit theorems for network driven sampling. *Accepted in Electronic Journal of Statistics*, 2017.

[9] N Binkiewicz, JT Vogelstein, and K Rohe. Covariate-assisted spectral clustering. *Biometrika*, 104(2):361–377, 2017.

[10] Karl Rohe, Tai Qin, and Bin Yu. Co-clustering directed graphs to discover asymmetries and directional communities. *Proceedings of the National Academy of Sciences*, 113(45):12679–12684, 2016.

[11] Juhee Cho, Donggyu Kim, and Karl Rohe. Asymptotic theory for estimating the singular vectors and values of a partially-observed low rank matrix with noise. *Statistica Sinica*, 27(4), 2017.

[12] Thu Le, Daniel Bolt, Eric Camburn, Peter Goff, and Karl Rohe. Latent factors in student–teacher interaction factor analysis. *Journal of Educational and Behavioral Statistics*, 42(2):115–144, 2017.

[13] Mohammad Khabbazian, Ricardo Kriebel, Karl Rohe, and Cécile Ané. Fast and accurate detection of evolutionary shifts in ornstein-uhlenbeck models. *Methods in Ecology and Evolution*, 7(7):811–824, 2016.

[14] Jinzhu Jia and Karl Rohe. Preconditioning to comply with the irrepresentable condition. *Electronic Journal of Statistics 2015, Vol. 9, No. 0, 1150-1172.*, 2015.

[15] Karl Rohe. Preconditioning for classical relationships: a note relating ridge regression and ols p-values to preconditioned sparse penalized regression. *Stat (International Statistical Institute journal for rapid publication)*, 4(1):157–166, 2015.

[16] K Rohe, T Qin, and H Fan. The highest dimensional stochastic blockmodel with a regularized estimator. *Statistica Sinica*, 24(4), 2014.

[17] Tai Qin and Karl Rohe. Regularized Spectral Clustering under the Degree-Corrected Stochastic Blockmodel. *Neural Information Processing Systems (NIPS)*, 2013.

[18] V Vu, J Cho, J Lei, and K Rohe. Fantope Projection and Selection: A near-optimal convex relaxation of sparse PCA. *Neural Information Processing Systems (NIPS)*, 2013.

[19] J Jia, K Rohe, and B Yu. The Lasso under poisson-like heteroskedasticity. *Statistica Sinica*, 23:99–118, 2013.

[20] K Rohe, B Yu, and S Chatterjee. Spectral clustering and the high dimensional stochastic blockmodel. *The Annals of Statistics*, 39(4):1878–1915, 2011.

Manuscripts and non-peer reviewed articles

[1] Yuling Yan, Bret Hanlon, Sebastien Roch, and Karl Rohe. Asymptotic seed bias in respondent-driven sampling. *arXiv preprint arXiv:1808.10593*, 2018.

[2] Karl Rohe and Tai Qin. The blessing of transitivity in sparse and stochastic networks. *arXiv preprint arXiv:1307.2302*, 2013.

[3] Song Wang and Karl Rohe. Don't mind the (eigen) gap; a comment on a discussion paper. *The Annals of Applied Statistics (Accepted)*, 2016.

[4] Q Cui, K Rohe, and Z Zhang. Discussion of: Estimating the historical and future probabilities of large terrorist events. *The Annals of Applied Statistics*, 7(4):1891–1894, 2014.

[5] Karl Rohe. A tale of two researchers. *Amstat News*, October1, 2012.

Graduate student advising

FORMER PhD STUDENTS:

1. Tai Qin (co-advised with Grace Wahba), Statistical Justifications for Computationally Tractable Network Data Analysis, Spring 2015.

2. Norbert Binkiewicz, Contextualized Network Analysis: Theory and Methods for Networks with Node Covariates, Summer 2015.

3. Juhee Cho, Statistical Inferences and applications for a low-rank matrix, Spring 2016.

4. Mohammad Khabbazian, Statistical inference with tree-indexed Markov processes, Fall 2016.

5. Thu Le, Statistical inference with social networks: applications in Health Care and Education, Summer 2017.

6. Song Wang, Spectral methods for community detection, Fall 2017.

CURRENT PhD STUDENTS: Yilin Zhang, Fan Chen, Muzhe Zeng, Emma Krauska.

UNDERGRADUATE HONORS PROJECTS WITH: Eric Swaney, Xiaoyi Yang, Nick Zaborek, Kaizheng Wang (Peking U), Haoyang Liu (Peking U), Zoe Russek, Alan Sayler, Emma Krauska, Jacob Rich, Jun Tao (Peking U), Xintian Han (Peking U), Yuling Yan (Peking U).

PhD COMMITTEES: Corey Lester (School of Pharmacy), Luwan Zhang, Donggyu Kim, Tien Vo, Gunwoong Park, Tram Ta, Nick Henders, Wenwen Zhang, Claudia Solis Lemus, Jeea Choi, Jing Kong, Vincent Chan, Zhigeng Geng, Lie Xiong, Qiurong Cui, Fan Yang, Dong Liu (Educational Sciences), Bryan Keller (Educational Sciences), Yi Chai, Yaoyao Xu, Chandler Zuo, Lilun Du.

Teaching

INTRODUCTION TO MATHEMATICAL STATISTICS (STAT 311) Fall 2011, Spring 2012, Fall 2012, Spring 2013, Spring 2014 (twice).

APPLIED LINEAR REGRESSION (STAT 333) Spring 2013, Fall 2013, Fall 2014, Spring 16, Fall 16, Fall 17.

STATISTICAL MACHINE LEARNING (STAT 479) Spring 2015.

DATA SCIENCE WITH R (STAT 479) Spring 2016, Spring 2017.

DATA SCIENCE WITH R (STAT 679) Fall 2016.

THEORY AND METHODS FOR SOCIAL NETWORK ANALYSIS (STAT 992) Fall 2015.

GRADUATE STUDENT INSTRUCTOR @ BERKELEY Ph.D. level Applied Statistics (stat 215), Upper Division Math Stat (stat 135), Intro to Prob and Stat for Business (stat 21).

Outreach

CREATOR AND ORGANIZER of the Data Science Seminar Series (DS3). This seminar series has hosted data scientists working for professional sports teams, political consulting firms, and in health technology. The talks are public and should be accessible to anyone interested in data science. Homepage: `http://stat.wisc.edu/~karlrohe/ds3`

CREATOR OF `murmuration.wisc.edu`. This is a website which updates everyday to characterize how different twitter "flocks" are processing and discussing the events of the day.

Professional Service

CHAIR for the 18th New Researchers conference–sponsored by IMS, NSF, ONR and Google–in Madison WI, July 2016.

NSF REVIEW PANELIST.

AD HOC REVIEWER: Annals of Statistics, Proceedings of the National Academy of Sciences, Statistical Analysis and Data Mining, Journal of Computational and Graphical Statistics, Political Analysis, Statistica Sinica, Biometrika, Journal of Multivariate Analysis, Neural Information Processing Systems (NIPS), Annals of Applied Statistics, Technometrics, COLT, Journal of the American Statistical Association, World Wide Web Conference (WWW), etc.

IMS COMMITTEE: NEW RESEARCHERS. This committee seeks to serve the broad community of new researchers in Statistics. The primary activity of this committee is to promote, plan, and execute the New Researchers Conference.