Sang-Yun Oh

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Education

Stanford University — Stanford, CA
Ph.D., Computational and Mathematical Engineering — *July 2013*

Stanford University — Stanford, CA
M.S., Statistics — *December 2011*

University of Utah — Salt Lake City, UT
M.S., Computational Engineering and Science — *August 2004*

University of California, Berkeley — Berkeley, CA
B.A., Physics — *December 1999*

Experience

Associate Professor — Santa Barbara, CA
Statistics and Applied Probability Department, University of California, Santa Barbara — *July 2021 – Present*

Faculty Scientist — Berkeley, CA
Computational Research Division, Lawrence Berkeley National Laboratory — *July 2015 – Present*

Assistant Professor — Santa Barbara, CA
Statistics and Applied Probability Department, University of California, Santa Barbara — *July 2015 – June 2021*

Postdoctoral Research Fellow — Berkeley, CA
Computational Research Division, Lawrence Berkeley National Laboratory — *July 2013 – July 2015*

Research Fellow — Berkeley, CA
Simons Institute for Theory of Computing, University of California, Berkeley — *Fall 2013*

Director of Analytics — Pasadena, CA
Analytics and Engineering, Interpolls, Inc. — *April 2005 – September 2007*

Instrumentation & Software Engineer — Berkeley, CA
Department of Functional Imaging, Lawrence Berkeley National Laboratory — *August 2000 – August 2004*

Publications

FROSTY: A High-Dimensional Scale-Free Bayesian Network Learning Method, Joshua Bang, **Sang-Yun Oh**, *Journal of Data Science, Volume 21, Issue 2 (2023): Symposium Data Science and Statistics (SDSS) 2022, pp. 354-367*

Family-wise error rate control in Gaussian graphical model selection via distributionally robust optimization, Chau Tran, Pedro Cisneros-Velarde, **Sang-Yun Oh**, Alex Petersen, *Stat 11 (1), e477*

Partial separability and functional graphical models for multivariate Gaussian processes, Javier Zapata, **Sang-Yun Oh**, Alex Petersen, *Biometrika 109 (3), 665-681*

Distributionally Robust Formulation and Model Selection for the Graphical Lasso, Pedro Cisneros-Velarde, **Sang-Yun Oh**, Alex Petersen, *International Conference on Artificial Intelligence and Statistics, 756-765*

A Scalable Sparse Cholesky-based Approach for Learning High-dimensional Covariance Matrices in Ordered Data, Kshitij Khare, **Sang-Yun Oh**, Syed Rahman, Bala Rajaratnam, *Machine Learning, 2019, 108, 2061-2086*

Communication-Avoiding Optimization Methods for Distributed Massive-Scale Sparse Inverse Covariance Estimation, Penporn Koanantakool, Alnur Ali, Ariful Azad, Aydin Buluc, Dmitriy Morozov, Leonid Oliker, Katherine Yelick, **Sang-Yun Oh**, *Proceedings of the 21st International Conference on Artificial Intelligence and Statistics (AISTATS), 2018*

Generalized Pseudolikelihood Methods for Inverse Covariance Estimation, Alnur Ali, Kshitij Khare, **Sang-Yun Oh**, Bala Rajaratnam, *Proceedings of the 20th International Conference on Artificial Intelligence and Statistics (AISTATS), 2017*

Communication-Avoiding Parallel Sparse-Dense Matrix-Matrix Multiplication, Penporn Koanantakool, Ariful Azad, Aydin Buluc, Dmitriy Morozov, **Sang-Yun Oh**, Leonid Oliker, Katherine Yelick, *IEEE International Parallel and Distributed Processing Symposium (IPDPS), 2016*

Revealing Fundamental Physics from the Daya Bay Neutrino Experiment using Deep Neural Networks, Evan Racah, Seyoon Ko, Peter Sadowski, Wahid Bhimji, Craig Tull, **Sang-Yun Oh**, Pierre Baldi, Prabhat, *International Conference on Machine Learning and Applications (ICMLA), 2016*

A convex pseudolikelihood framework for high dimensional partial correlation estimation with convergence guarantees, Kshitij Khare, **Sang-Yun Oh**, Bala Rajaratnam, *Journal of the Royal Statistical Society: Series B (Statistical Methodology)77.4 (Sept. 2015) pp. 803–825., 2015*

Optimization Methods for Sparse Pseudo-Likelihood Graphical Model Selection, **Sang-Yun Oh**, Onkar Dalal, Kshitij Khare, Bala Rajaratnam, *Advances in Neural Information Processing Systems (NIPS) 27(2014) pp. 667–675., 2014*

Cosmology from MAXIMA-1, BOOMERANG, and COBE DMR Cosmic Microwave Background Observations, A. H. Jaffe, P. A. R. Ade, A. Balbi, J. J Bock, J. R. Bond, J. Borrill, A. Boscaleri, K. Coble, B. P. Crill, P. Bernardis, P. Farese, P. G. Ferreira, K. Ganga,M. Giacometti, S. Hanany, E. Hivon, V. V. Hristov, A. Iacoangeli, A. E. Lange, A. T. Lee, L. Martinis, S. Masi, P. D. Mauskopf, A. Melchiorri, T.Montroy, C. B. Netterfield, **S. Oh**, E. Pascale, F. Piacentini, D. Pogosyan, S. Prunet, B. Rabii, S. Rao, P. L. Richards, G. Romeo, J. E. Ruhl, F.Scaramuzzi, D. Sforna, G. F. Smoot, R. Stompor, C. D. Winant, J. H. P. Wu, *Physical Review Letters 86.16 (Apr. 2001) pp. 3475–3479., 2001*

Making maps of the cosmic microwave background: The MAXIMA example, R. Stompor, A. Balbi, J. D. Borrill, P. G. Ferreira, S. Hanany, A. Jaffe, A. Lee, **S. Oh**, B. Rabii, P. L. Richards, G. F. Smoot, C. D. Winant, J.H.P. Wu, *Physical Review, D65.2, 2001*

Asymmetric Beams in Cosmic Microwave Background Anisotropy Experiments, J. Wu, A. Balbi, J. Borrill, P. G. Ferreira, S. Hanany, A. H. Jaffe, A. T. Lee, **S. Oh**, B. Rabii, P. L. Richards, G. F. Smoot, R. Stompor, C. D. Winant, *The Astrophysical Journal Supplement Series, 132.1 (Jan. 2001) pp. 1–17., 2001*

MAXIMA-1: A Measurement of the Cosmic Microwave Background Anisotropy on Angular Scales of 10 arcminutes to 5 degrees, S. Hanany, P. Ade, A. Balbi, J. Bock, J. Borrill, A. Boscaleri, P. Bernardis, P. G. Ferreira, V. V. Hristov, A. H. Jaffe, A. E. Lange, A. T. Lee, P. D.Mauskopf, C. B. Netterfield, **S. Oh**, E. Pascale, B. Rabii, P. L. Richards, G. F. Smoot, R. Stompor, C. D. Winant, J. H. P. Wu, *The Astrophysical Journal 545.1 (Dec. 2000) pp. L5–L9., 2000*

TEACHING

PSTAT 135/235: Big Data Analytics, since 2023

PSTAT 134/234: Statistical Data Science, since 2018

PSTAT 120B: Mathematical Statistics, 2015-2018

PSTAT 131/231: Statistical Machine Learning, 2015-2019

PSTAT 232: Computational Methods in Statistics, since 2019

PSTAT 262: Topics in Graphical Models, Spring 2016

OPEN-SOURCE SOFTWARE

gconcord: Pseudolikelihood-based method for undirected graphical model selection (R package)

gconcordopt: Proximal-gradient method for faster computation of CONCORD estimates (R package)

pyconcord: Proximal-gradient method for faster computation of CONCORD estimates (Python package)

HP-CONCORD: Massively parallel computation of CONCORD estimates (C++ code)