

Address:

Department of Mathematics
 TUM School of Computation, Information and Technology
 Technical University of Munich
 Boltzmannstr. 3
 85748 Garching b. München, Germany

Employment:

2019–	Technical University of Munich	Professor of Mathematical Statistics
2019–	University of Washington	Affiliate Professor of Statistics
2018–2019	University of Copenhagen	Professor of Statistics
2012–2019	University of Washington	Professor of Statistics
2011–2012	The University of Chicago	Professor of Statistics
2009–2011	The University of Chicago	Associate Professor of Statistics
2005–2009	The University of Chicago	Assistant Professor of Statistics
2004–2005	University of California, Berkeley	Postdoc

Visiting Positions:

2017	Institute of Statistical Mathematics, Tokyo, Japan (3 months)
2007	University of Minnesota, Institute for Mathematics and its Applications (3 months)

Education:

2001–2004	University of Washington (Advisors: Michael D. Perlman, Thomas S. Richardson)	Ph.D. in Statistics
1994–2000	Universität Augsburg, Germany (Advisor: Friedrich Pukelsheim)	Diplom in Applied Mathematics
1998–1999	Université Toulouse III Paul Sabatier, France (Advisor: Jean-Marc Azaïs)	DEA in Applied Mathematics

Honors:

2021	ELLIS Fellow, European Lab for Learning & Intelligent Systems Unit Munich
2020	ERC Advanced Grant, European Research Council
2020	Elected Member, International Statistical Institute
2019	Ethel Newbold Prize, Bernoulli Society
2018	Elected Foreign Member of the Royal Danish Academy of Sciences and Letters
2016	Fellow of the Institute of Mathematical Statistics (IMS)
2014	Medallion Lecture, Institute of Mathematical Statistics (IMS)
2014	Best paper award, Bayesian Analysis

- 2004 Best Student Paper Award, Conference on Uncertainty in Artificial Intelligence
- 2003 Birnbaum Award, Department of Statistics, University of Washington.

Grants:

- 2021–2025 TUM-ICL Joint Academy of Doctoral Studies, “Learning and Analyzing Discrete Geometric Structure in Statistical Models”
- 2021–2025 Co-PI in DFG Consortium “Mathematical Research Data Initiative (MaRDI)”
- 2020–2025 ERC Advanced grant, “Graphical Models for Complex Multivariate Data”
- 2017–2020 NSF grant, “Identification and Statistical Inference in Graphical Models”
- 2016–2020 NSF grant, “Statistical Methods for Differential Network Biology With Applications to Aging”, Co-PI with A. Shojaie, D. Promislow
- 2013–2016 NSF grant, “Bayesian Information Criteria and Problems of Parameter Identifiability”
- 2014–2015 NSA grant, “Bayesian Information Criteria”
- 2013–2014 Royalty Research Fund grant, University of Washington
- 2009–2013 Sloan Research Fellowship
- 2008–2013 NSF CAREER grant, “Statistical Inference in Algebraic Models with Singularities”
- 2005–2008 NSF grant, “Graphical and Algebraic Models for Multivariate Categorical Data”

Editorial Activities:

- 2020– Associate editor, *Journal of the Royal Statistical Society Series B*
- 2019– Advisory board for the new journal *Algebraic Statistics*
- 2018– Associate editor, *Biometrika*
- 2012–2021 Associate editor, *Electronic Journal of Statistics*
- 2007–2015 Associate editor, *Annals of Statistics*
- 2007–2011 Associate editor, *Journal of the Royal Statistical Society Series B*
- 2013–2015 Guest editor, Special Issue on Statistics, *Linear Algebra and Its Applications*
- 2007 Guest editor, Issue on “Algebraic Statistics and Computational Biology,” *Statistica Sinica*
- 2007–2021 Editorial board, *Metrika*
- 2004– Referee for most major Statistics journals

Other Professional Activities:

- 2023 Organizer, Workshop on Bayesian Statistics and Statistical Learning - New Directions in Algebraic Statistics, Institute for Mathematical and Statistical Innovation (IMSI), Chicago, USA
- 2022 Member, Program Committee, 2022 IMS International Conf. on Statistics and Data Science (ICSIDS)
- Organizer, Workshop on Algebraic Structures in Statistical Methodology, Math. Forschungsinstitut Oberwolfach
- 2021–2027 Core Member, Munich Data Science Institute (MDSI)
- 2021– Member, European Regional Committee, Bernoulli Society

Member, Organizing Committee, SIAM Conf. on Applied Algebraic Geometry
 Member, Program Committee, International Conf. on Artificial Intelligence and Statistics
 Member, Senior Program Committee, Conf. on Uncertainty in Artificial Intelligence
 Organizer, Invited session on Graphical Causal Models at ISI World Congress
 2020–2021 Co-organizer, Algebraic Statistics Online Seminar
 2020 Member, Senior Program Committee, Conf. on Uncertainty in Artificial Intelligence
 Member, Program Committee, Workshop on Algebraic Statistics, University of Hawaii
 2018–2019 Chair, Committee to Select Editors, Institute of Mathematical Statistics
 2017–2019 Member, Council of the Institute of Mathematical Statistics
 2017–2018 Member, Committee to Select Editors, Institute of Mathematical Statistics
 Member, Advisory board for Mathematics Research Communities Program, American Mathematical Society
 2017–2018 Member, Program Committee, IMS Annual Meeting 2018
 2017 Organizer, Workshop on Algebraic Statistics, Math. Forschungsinstitut Oberwolfach
 2016 Organizer, AMS Math Research Communities on Algebraic Statistics, Snowbird, UT
 2013 Organizer, Invited session on Singular Learning Theory, SIAM Conf. on Applied Algebraic Geometry, Fort Collins, CO
 2012 Program Chair of the Institute of Mathematical Statistics for the 2012 WNAR Conf.
 2011 Organizer, Invited session on Graphical Statistical Models, SIAM Conf. on Applied Algebraic Geometry, Raleigh, NC
 2010–2011 Chair, Committee on Special Lectures, Institute of Mathematical Statistics
 2010 Co-organizer, Workshop on Parameter Identification in Graphical Models, American Institute of Mathematics, Palo Alto
 2008–2010 Member, Committee on Special Lectures, Institute of Mathematical Statistics
 2008 Co-organizer, Seminar on Algebraic Statistics, Math. Forschungsinstitut Oberwolfach
 Organizing Committee member, Program on Algebraic Methods in Systems Biology and Statistics, Statistical and Applied Mathematical Sciences Institute (SAMSI)
 2007 Organizer, Invited session on Graphical Models, Annual Meeting of the Western North American Region (WNAR) of the International Biometric Society
 2004–2009 Member, Program Committee, Conf. on Uncertainty in Artificial Intelligence

Ph.D. Students:

2023	Jun Wu	Homoscedasticity and feedback loops in graphical models
2022	Wenyu Chen	Causal structure learning in high dimensions (co-advised with Ali Shojaie)
2020	Shiqing Yu	Non-Gaussian graphical models: Estimation with score matching and causal discovery under zero-inflation (co-advised with Ali Shojaie)
2018	Amit Meir	Estimation and testing following model selection
	Y. Samuel Wang	Linear structural equation models with non-Gaussian errors: Estimation and discovery
	Luca Weihs	Parameter identification and assessment of independence in multivariate statistical modeling

	Chaoyu Yu	Adaptive statistical inference procedures for multigroup data (co-advised with Peter Hoff)
2017	Lina Lin	Methods for estimation and inference for high-dimensional models (co-advised with Ali Shojaie)
2016	Dennis Leung	Testing independence in high dimensions and identifiability of graphical models
	Andrew McDavid	Statistical hurdle models for single cell gene expression: Differential expression and graphical modeling (co-advised with Raphael Gottardo)
2014	Chris Fox	Interpretation and inference of linear structural equation models
2012	Rina Foygel Barber	Prediction and model selection for high-dimensional data with sparse or low-rank structure (co-advised with Nati Srebro)
	Han Xiao	Simultaneous inference on sample covariances (co-advised with Wei-Biao Wu)
2010	Michael Finegold	Robust network inference with multivariate t -distributions
Current supervision:		Philipp Dettling, David Strieder, Konstantin Göbler, Nils Sturma, Daniele Tramontano, Daniela Schkoda, Sarah Lupp

Conference and Workshop Presentations:

2023	Stochastics Meeting Lunteren, NL
	TUM IGSSE Martini Colloquium
	Workshop on Algebraic Statistics for Ecological and Biological Systems, Institute for Mathematical and Statistical Innovation (IMSI), Chicago, USA
	Computations and Data in Algebraic Statistics, Oaxaca, MX (virtual)
	Causal Inference & Quantum Foundations Workshop, Perimeter Institute for Theoretical Physics, Toronto, CAN (virtual)
	16th German Probability and Statistics Days, University of Duisburg-Essen, Essen, GER
	Workshop on Mathematical Statistics in the Information Age, University of Freiburg, GER
2022	Workshop on Algebraic Structures in Statistical Methodology, Oberwolfach, GER
	ETH-UCPH-TUM Workshop on Graphical Models, Raitenhaslach, GER
	MaRDI Annual Workshop, Berlin, GER
	2022 IMS International Conference on Statistics and Data Science, Florence, IT
	Workshop on Re-thinking High-dimensional Mathematical Statistics, Oberwolfach, GER
2021	Lecture at the Mathematics in the Sciences Day, MPI MiS Leipzig, GER
	Joint Statistical Meetings (virtual)
	Workshop on High Dimensionality and Data Analysis, Hausdorff Center for Mathematics, Bonn, GER
	Ethel Newbold Award lecture at the ISI World Statistics Congress, The Hague, NL (virtual)
	Conference on Uncertainty in Artificial Intelligence (UAI2021, virtual)
	MHC2021 Workshop on Mixtures, Hidden Markov Models, and Clustering, Paris, FR (virtual)
	Keynote speaker at the 8th Channel Network Conference of the French, Belgian, British and Irish and Dutch Biometric Societies (virtual).

- 2020 International Conference of the ERCIM WG on Computational and Methodological Statistics (CMStatistics 2020, virtual)
 Conference on Uncertainty in Artificial Intelligence (UAI2020, virtual)
 TUM ICL Mathematics Workshop, TU Munich, GER
- 2019 Workshop on Foundations and New Horizons for Causal Inference, Oberwolfach, GER
 Workshop on Graphical Models: Conditional Independence and Algebraic Structures, TU Munich, GER
 Opening Conference on Varieties, Polyhedra, Computation, FU Berlin, GER
- 2018 IMS Annual Meeting, Vilnius, Lithuania
 Workshop on Statistics in Complex Systems, Copenhagen, DK
- 2017 Workshop on Mathematical Methods of Modern Statistics, CIRM, Luminy, FR
 Working Group on Model-Based Clustering, Perugia, IT
 SIAM Conference on Applied Algebraic Geometry, Atlanta, GA, USA
 Workshop on Graphical Models, Institute of Statistical Mathematics, Tokyo, JP
 Workshop on Algebraic and Geometric Methods in Statistics, Institute of Statistical Mathematics, Tokyo, JP
- 2016 Royal Statistical Society, Read Paper, London, UK
 Workshop on Computationally and Statistically Efficient Inference for Complex Large-scale Data, Oberwolfach, GER
 Celebration of 60th Year of the University of Chicago's Department of Statistics
- 2015 Mathematical Society of Japan Seasonal Institute, Osaka
 Working Group on Model-Based Clustering, Seattle, WA, USA
- 2014 Joint Statistical Meetings, Boston, MA, USA
 Prague Stochastics, CZ
 Abel Symposium on Statistical Analysis for High-Dimensional Data, NO
 World Meeting of International Society for Bayesian Analysis (ISBA), Cancun, MX
- 2013 Joint Statistical Meetings, Montreal, CAN
 SIAM Conference on Applied Algebraic Geometry, Fort Collins, CO, USA
 Working Group on Model-Based Clustering, Bologna, IT
 UW-Microsoft Research Machine Learning Day, Seattle, WA, USA
- 2012 NIPS 2012 (Neural Information Processing Systems), Lake Tahoe, USA
 Algebraic Statistics in the Alleghenies, Penn State University, PA, USA
 NSF Workshop on High-Dimensional Data, Yale University, New Haven, CT, USA
 Midwest Statistics Research Colloquium, University of Wisconsin, Madison, WI, USA
 Statistics Winter Workshop, University of Florida, Gainesville, FL, USA
- 2011 Workshop on Singular Learning Theory, American Institute of Mathematics (AIM), Palo Alto, CA, USA
 SIAM Conference on Applied Algebraic Geometry, Raleigh, NC, USA
 ISI World Statistics Congress, Dublin, IE
 Humboldt Kolleg, Gothenburg, SE

- International Indian Statistical Association Conference, Raleigh, NC, USA
 Workshop on Solving Polynomial Equations, Stockholm, SE
- 2010 Lecturer at 3^e cycle romand de statistique et de probabilités appliquées (3 lectures), CH
 Special session on Applications of Algebraic Geometry, AMS Joint Math Meetings, San Francisco, CA, USA
 NIPS 2010 (Neural Information Processing Systems), Vancouver, CAN
 DREAM 5 (Dialogue for Reverse Engineering Assessments and Methods), New York, NY, USA
- 2008 Opening workshop, Program on Algebraic Methods in Systems Biology and Statistics, Statisticaland Applied Mathematical Sciences Institute, NC, USA
 COMPSTAT 2008, Porto, PT
 Workshop on Methods for Analyzing Longitudinal Data, Gothenburg, SE
 7th World Congress in Probability and Statistics, Singapur, SGP
 Symposium on Mathematical Aspects of Graphical Models, Durham, UK
- 2007 Special session on Combinatorial Enumeration, Optimization, Geometry, and Statistics, AMS Fall Southeastern Section Meeting, Murfreesboro, TN, USA
 Special session on Numerical and Symbolic Techniques in Algebraic Geometry and Its Applications, AMS Fall Central Section Meeting, Chicago, IL, USA
 Workshop on Theoretical Effectivity and Practical Effectivity of Groebner Bases, Research Institute for Mathematical Sciences, Kyoto, JP
 Workshop on Applications in Biology, Dynamics, and Statistics, Institute for Mathematics and its Applications, Minneapolis, MN, USA
- 2006 Bayesian Focus Week, Statistical and Applied Mathematical Sciences Institute, NC, USA
 Prague Stochastics, CZ
 Annual Meeting of the Institute of Mathematical Statistics, Rio de Janeiro, BR
 European Meeting of Statisticians, Torun, PL
 Session on Algebraic Statistics, Joint Mathematics Meetings, San Antonio, TX, USA
- 2005 Workshop on Algebraic Statistics and Computational Biology, Clay Mathematics Institute, Boston, MA, USA
 Workshop on Multivariate Systems with Independence Structures, Gothenburg, SE
 RECOMB 2015, Boston, MA, USA
- 2004 20th Conference on Uncertainty in Artificial Intelligence, Banff, CAN (plenary talk)
 6th Bernoulli World Congress, Barcelona, ES
 Workshop on Algorithmic, Combinatorial and Applicable Real Algebraic Geometry, MathematicalSciences Research Institute (MSRI), Berkeley, CA, USA
 Workshop on Analysis and Design of Electoral Systems, Oberwolfach, GER
- 2003 Workshop on Computational Algebraic Statistics, American Institute of Mathematics (AIM), Palo Alto, CA, USA
 Workshop on Computational Aspects of Graphical Models, Aalborg, DK
 19th Conference on Uncertainty in Artificial Intelligence (UAI), Acapulco, MX
 Joint Statistical Meetings, San Francisco, CA, USA

First Joint Meeting of the Institute of Mathematical Statistics and the International Society for Bayesian Analysis, Puerto Rico, USA

2002 Annual Meeting of the Institute of Mathematical Statistics, Banff, CAN

Department Seminars:

- 2024 Universität Augsburg, GER
- 2023 University of Washington, Seattle, WA, USA; University of Economics and Business, Vienna, AT; Leibniz Institute for Prevention Research and Epidemiology, Bremen, GER
- 2022 Ruhr-Universität Bochum, GER; Université Libre de Bruxelles, BE; Online Causal Inference Seminar; TU Delft, NL; Warwick CRiSM Seminar; Applied Algebra and Analysis Online Seminar (TU Braunschweig, GER, Universität Osnabrück, GER)
- 2021 KTH Stockholm, SE (online); Math Machine Learning Seminar MPI MiS + UCLA (online)
- 2020 Columbia University, New York, NY, USA; University of Toronto, CAN (online)
- 2019 Ludwig-Maximilians-Universität, Munich, GER
- 2018 University of Copenhagen, DK; Ecole Polytechnique, Paris, FR
- 2017 Stanford University, CA, USA; Institute of Statistical Mathematics, JP; Keio University, Yokohama, JP; Academia Sinica, TW; Booth School of Business, University of Chicago, IL, USA; Texas A&M, TX, USA
- 2016 Cornell University, Ithaca, NY, USA; Duke University, Durham, NC, USA; University of Washington, Seattle, WA, USA
- 2015 Princeton University, NJ, USA; University of Kentucky, Lexington, KY, USA
- 2013 Georgia Tech, Atlanta, GA, USA; Universität Augsburg, GER
- 2012 Universität Wien, AT; Universität Regensburg, GER; University of Washington, Seattle, WA, USA
- 2011 University of Washington, Seattle, WA, USA; Universität Stuttgart, GER; Universität Mannheim, GER; University of Perugia, IT
- 2010 University of California, Davis, CA, USA; University of Chicago (Business School), IL, USA
- 2009 North Carolina State University (Math), Raleigh, NC, USA ; Ohio State University, Columbus, OH, USA
- 2008 University of California, Berkeley, CA, USA; University of Washington, Seattle, WA, USA; University of Illinois at Chicago, IL, USA; Max-Planck Institute Leipzig, GER; Research Institute for Symbolic Computation, Linz, AT
- 2007 Northern Illinois University, DeKalb, IL, USA; Purdue University, West Lafayette, IN, USA; University of Kentucky, Lexington, KY, USA; University of Illinois at Urbana-Champaign, IL, USA; Université de Montréal & McGill University, Quebec, CAN
- 2006 York University, Toronto, CAN; University of Wisconsin, Madison (Biostatistics), WI, USA
- 2005 Universität Heidelberg, GER; ETH Zürich, CH; University of California, Berkeley (Biostatistics), CA, USA; University of Illinois at Chicago, IL, USA
- 2004 University of Pennsylvania, Philadelphia, PA, USA; University of California, Davis, CA, USA; University of Minnesota, Minneapolis, MN, USA; University of Chicago, IL, USA; Carnegie Mellon University, Pittsburgh, PA, USA; University of Michigan, Ann Arbor, MI, USA; University of California, Irvine, CA, USA; Harvard University, Cambridge, MA, USA; Columbia University, New York, NY, USA; University of Toronto, ON, CAN; Stanford University, CA, USA; University of British Columbia, Vancouver, BC, CAN

- 2003 University of Washington (Electrical Engineering), Seattle, WA, USA; Universität Augsburg, GER
- 2002 Universität Mainz, GER; University of Washington, Seattle, WA, USA

Books:

- 2 Handbook of Graphical Models (with Marloes Maathuis, Steffen Lauritzen, Martin Wainwright). Chapman & Hall/CRC Handbooks of Modern Statistical Methods, 2019.
- 1 Lectures on Algebraic Statistics (with Bernd Sturmfels, Seth Sullivant). Oberwolfach Seminars, Vol. 39. Birkhäuser Verlag, Basel, 2009.

Articles (in Journals and Edited Volumes):

- 95 Testing many constraints in possibly irregular models using incomplete U-statistics (with Nils Sturma, Dennis Leung). *Journal of the Royal Statistical Society Series B: Statistical Methodology*, (2024): 1–26.
- 94 Unpaired multi-domain causal representation learning (with Nils Sturma, Chandler Squires, Caroline Uhler). *Advances in Neural Information Processing Systems*, **36**, (2024).
- 93 On Azadkia-Chatterjee’s conditional dependence coefficient (with Hongjian Shi, Fang Han). *Bernoulli*, **30**, no. 2, (2024): 851–877.
- 92 Causal Discovery with Unobserved Confounding and Non-Gaussian Data (with Y. Samuel Wang). *Journal of Machine Learning Research*, **24**, paper no. 271, (2023): 1–61.
- 91 Assessable and interpretable sensitivity analysis in the pattern graph framework for nonignorable missingness mechanisms (with Alireza Zamanian, Narges Ahmidi). *Statistics in Medicine*, **42**, no. 29 DOI: 10.1002/sim.9920 (2023): 5419–5450.
- 90 Confidence in causal inference under structure uncertainty in linear causal models with equal variances (with David Strieder). *Journal of Causal Inference*, **11**, no. 1, DOI: 10.1515/jci-2023-0030 (2023).
- 89 Identifiability in Continuous Lyapunov Models (with Philipp Dettling, Roser Homs, Carlos Amndola, Niels Richard Hansen). *SIAM Journal on Matrix Analysis and Applications*, **44**, no. 4, (2023): 1799–1821.
- 88 Partial Homoscedasticity in Causal Discovery with Linear Models (with Jun Wu). *IEEE Journal on Selected Areas in Information Theory*, **4**, DOI: 10.1109/JSAIT.2023.3328476 (2023): 639–650.
- 87 Learning Linear Gaussian Polytree Models With Interventions (with Daniele Tramontano, Leonard Waldmann, Eliana Duarte). *IEEE Journal on Selected Areas in Information Theory*, **4**, DOI: 10.1109/JSAIT.2023.3328429 (2023): 569–578.
- 86 Causal structural learning via local graphs (with Wenyu Chen, Ali Shojaie). *SIAM Journal on Mathematics of Data Science*, **5**, no. 2, (2023): 280–305.
- 85 Discussion of “A note on universal inference“ by Timmy Tse and Anthony Davison (with Hongjian Shi, David Strieder). *Stat*, **12**, no. 1, (2023): e574.
- 84 Third-order moment varieties of linear non-Gaussian graphical models (with Carlos Améndola, Alexandros Grosdos, Roser Homs, Elina Robeva). *Information and Inference: A Journal of the IMA*, **12**, no. 3, (2023): 1405–1436.
- 83 Fine-grained network traffic prediction from coarse data (with Krzysztof Rusek). *Austrian Journal of Statistics*, **52**, no. 3, (2023): 114–123.

- 82 On the choice of the splitting ratio for the split likelihood ratio test (with David Strieder). *Electronic Journal of Statistics*, **16**, no. 2, (2022): 6631–6650.
- 81 Half-trek criterion for identifiability of latent variable models (with Rina Foygel Barber, Nils Sturma, Luca Weihs). *Annals of Statistics*, **50**, no. 6, (2022): 3174–3196.
- 80 Generalized score matching for general domains (with Shiqing Yu, Ali Shojaie). *Information and Inference: A Journal of the IMA*, **11**, no. 2, (2022): 739–780.
- 79 On universally consistent and fully distribution-free rank tests of vector independence (with Hongjian Shi, Marc Hallin, Fang Han). *Annals of Statistics*, **50**, no. 4, (2022): 1933–1959.
- 78 On the power of Chatterjee rank correlation (with Hongjian Shi, Fang Han). *Biometrika*, **109**, no. 2, (2022): 317–333.
- 77 Distribution-free consistent independence tests via center-outward ranks and signs (with Hongjian Shi, Fang Han). *Journal of the American Statistical Association*, **117**, no. 537, (2022): 395–410.
- 76 Existence and uniqueness of the Kronecker covariance MLE (with Satoshi Kuriki, Peter Hoff). *Annals of Statistics*, **49**, no. 5, (2021): 2721–2754.
- 75 CorDiffViz: an R package for visualizing multi-omics differential correlation networks (with Shiqing Yu, Daniel E. L. Promislow, Ali Shojaie). *BMC Bioinformatics*, **22**, article 486, (2021).
- 74 High dimensional independence testing with maxima of rank correlations (with Fang Han, Hongjian Shi). *Annals of Statistics*, **48**, no. 6, (2020): 3206–3227.
- 73 Nested covariance determinants and restricted trek separation in Gaussian graphical models (with Elina Robeva, Luca Weihs). *Bernoulli* **26**, no. 4, (2020): 2503–2540.
- 72 Genetic and metabolomic architecture of variation in diet restriction-mediated lifespan extension in *Drosophila* (with Kelly Jin; Kenneth A. Wilson; Jennifer N. Beck; Christopher S. Nelson; George W. Brownridge III; Benjamin R. Harrison; Danijel Djukovic; Daniel Raftery; Rachel B. Brem; Shiqing Yu; Ali Shojaie; Pankaj Kapahi; Daniel Promislow). *PLOS Genetics* **10**, no. 7, (2020): e1008835.
- 71 High-dimensional causal discovery under non-Gaussianity (with Y. Samuel Wang). *Biometrika* **107**, no. 1, (2020): 41–59.
- 70 On causal discovery with equal variance assumption (with Wenyu Chen, Y. Samuel Wang). *Biometrika* **106**, no. 4, (2019): 973–980.
- 69 Generalized score matching for non-negative data (with Shiqing Yu, Ali Shojaie). *Journal of Machine Learning Research* **20**, paper no. 76, (2019): 1–70.
- 68 Graphical models for zero-inflated single cell gene expression (with Andrew McDavid, Raphael Gottardo, Noah Simon). *Annals of Applied Statistics* **13**, no. 2, (2019): 848–873.
- 67 The maximum likelihood threshold of a path diagram (with Chris Fox, Andreas Käuffl, Guillaume Pouliot). *Annals of Statistics* **47**, no. 3, (2019): 1536–1553.
- 66 Computation of maximum likelihood estimates in cyclic structural equation models (with Chris Fox, Y. Samuel Wang). *Annals of Statistics* **47**, no. 2, (2019): 663–690.
- 65 Algebraic problems in structural equation modeling. *The 50th Anniversary of Gröbner Bases*, Advanced Studies in Pure Mathematics, Mathematical Society of Japan, (2018): 35–86.
- 64 Symmetric rank covariances: a generalised framework for nonparametric measures of dependence (with Luca Weihs, Nicolai Meinshausen). *Biometrika* **105**, no. 3, (2018): 547–562.

- 63 Robust and sparse Gaussian graphical modeling under cell-wise contamination (with Shota Kata-yama, Hironori Fujisawa). *Stat* **7**, no. 1, (2018): e181.
- 62 Determinantal generalizations of instrumental variables (with Luca Weihs, Bill Robinson, Emilie Dufresne, Jennifer Kenkel, Kaie Kubjas, Reginald L. McGee II, Nhan Nguyen, Elina Robeva). *Journal of Causal Inference* **6**, no. 1, (2018).
- 61 Testing independence in high dimensions with sums of squares of rank correlations (with Dennis Leung). *Annals of Statistics* **46**, no. 1, (2018): 280–307.
- 60 Empirical likelihood for linear structural equation models with dependent errors (with Y. Samuel Wang). *Stat* **6**, no. 1, (2017): 434–447.
- 59 A Bayesian information criterion for singular models (with Martyn Plummer). *Journal of the Royal Statistical Society Series B* **79**, (2017): 323–380, discussion paper.
- 58 Structure learning in graphical modeling (with Marloes Maathuis). *Annual Review of Statistics and Its Application* **4**, (2017): 365–393.
- 57 Covariate-adaptive clustering of exposures for air pollution epidemiology cohorts (with Joshua Keller, Timothy Larson, Joel Kaufman, Dale Sandler, Adam Szpiro). *Annals of Applied Statistics* **11**, no. 1, (2017): 93–113.
- 56 Marginal likelihood and model selection for Gaussian latent tree and forest models (with Shaowei Lin, Luca Weihs, Piotr Zwiernik). *Bernoulli* **23**, no. 2, (2017): 1202–1232.
- 55 Large-sample theory for the Bergsma-Dassios sign covariance (with Preetam Nandy, Luca Weihs). *Electronic Journal of Statistics* **10**, no. 2, (2016): 2287–2311.
- 54 Generic identifiability of linear structural equation models by ancestor decomposition (with Luca Weihs). *Scandinavian Journal of Statistics* **43**, (2016): 1035–1045.
- 53 Estimation of high-dimensional graphical models using regularized score matching (with Lina Lin, Ali Shojaie). *Electronic Journal of Statistics* **10**, no. 1, (2016): 806–854.
- 52 Identifiability of directed Gaussian graphical models with one latent source (with Dennis Leung, Hisayuki Hara). *Electronic Journal of Statistics* **10**, no. 1, (2016): 394–422.
- 51 Order-invariant prior specification in Bayesian factor analysis (with Dennis Leung). *Statistics & Probability Letters* **111**, (2016): 60–66.
- 50 Efficient computation of the Bergsma-Dassios sign covariance (with Luca Weihs, Dennis Leung). *Computational Statistics* **31**, no. 1, (2016): 315–328.
- 49 Laplace approximation in high-dimensional Bayesian regression (with Rina Foygel Barber, Kean Ming Tan). *Statistical Analysis for High-Dimensional Data: The Abel Symposium 2014*, Springer International Publishing, Cham, (2016): pp. 15–36 .
- 48 Maximum likelihood estimates for Gaussian mixtures are transcendental (with Carlos Amendola, Bernd Sturmfels). In *Mathematical Aspects of Computer and Information Sciences. MACIS 2015*, Lecture Notes in Computer Science, vol. 9582. Springer, Cham, (2016): pp. 579–590.
- 47 Wald tests of singular hypotheses (with Han Xiao). *Bernoulli* **22**, no. 1, (2016): 38–59.
- 46 High-dimensional Ising model selection with Bayesian information criteria (with Rina Foygel Barber). *Electronic Journal of Statistics* **9**, (2015): 567–607.
- 45 Adaptive rhythm sequencing: A method for dynamic rhythm classification during CPR (with Heemun Kwok, Jason Coult, Thomas Rea, Lawrence Sherman). *Resuscitation* **91**, (2015): 26–31.

- 44 On the causal interpretation of acyclic mixed graphs under multivariate normality (with Chris Fox, Andreas Käuffl). *Linear Algebra and Its Applications* **473**, (2015): 93–113.
- 43 Robust Bayesian graphical modeling using Dirichlet t-distributions (with Michael Finegold). *Bayesian Analysis* **9**, no. 3, (2014): 521–550, with discussion, rejoinder pp. 591–596.
- 42 PC algorithm for Gaussian copula graphical models (with Naftali Harris). *Journal of Machine Learning Research* **14**, (2013): 3365–3383.
- 41 Half-trek criterion for generic identifiability of linear structural equation models (with Rina Foygel, Jan Draisma). *Annals of Statistics* **40**, no. 3, (2012): 1682–1713.
- 40 Correction on “Moments of minors of Wishart matrices” (with Aldo Goia). *Annals of Statistics* **40**, no. 2, (2012): 1283–1284.
- 39 Maximum likelihood degree of variance component models (with Elizabeth Gross, Sonja Petrovic). *Electronic Journal of Statistics* **6**, (2012): 993–1016.
- 38 Wisdom of crowds for robust gene network inference (as part of the ‘DREAM5 Consortium’). *Nature Methods* **9**, (2012): 796–804.
- 37 SPIn: model selection for phylogenetic mixtures via linear invariants (with Anna Kedzierska, Roderic Guigo, and Marta Casanellas). *Molecular Biology and Evolution* **29**, no. 3, (2012): 929–937.
- 36 Global identifiability of linear structural equation models (with Rina Foygel, Seth Sullivant), *Annals of Statistics* **39**, no. 2, (2011): 865–886.
- 35 Robust graphical modeling of gene networks using classical and alternative t-distributions (with Michael Finegold). *Annals of Applied Statistics* **5**, no. 2A, (2011): 1057–1080.
- 34 Quantifying the failure of bootstrap likelihood ratio tests (with Ben Williams). *Biometrika* **98**, no. 4, (2011): 919–934.
- 33 On a parametrization of positive semidefinite matrices with zeros (with Josephine Yu), *SIAM Journal on Matrix Analysis and Applications* **31**, no. 5, (2010): 2665–2680.
- 32 A geometric interpretation of the characteristic polynomial of reflection arrangements (with Carly Klivans). *Proceedings of the American Mathematical Society* **138**, (2010): 2873–2887.
- 31 Smoothness of Gaussian conditional independence models (with Han Xiao). In *Algebraic Methods in Statistics and Probability II*, (Eds. M. Viana and H. Wynn), Contemporary Mathematics, vol. 516, Amer. Math. Soc., Providence, RI, (2010): pp. 155–177.
- 30 Finiteness of small factor analysis models (with Han Xiao). *Annals of the Institute of Statistical Mathematics* **62**, no. 4, (2010): 775–783.
- 29 Discrete chain graph models. *Bernoulli* **15**, no. 3, (2009): 736–753.
- 28 Likelihood ratio tests and singularities. *Annals of Statistics* **37**, no. 2, (2009): 979–1012.
- 27 Computing maximum likelihood estimates in recursive linear models (with Michael Eichler, Thomas S. Richardson). *Journal of Machine Learning Research* **10**, (2009): 2329–2348.
- 26 Moments of minors of Wishart matrices (with Hélène Massam, Ingram Olkin). *Annals of Statistics* **36**, no. 5, (2008): 2261–2283.
- 25 Graphical methods for efficient likelihood inference in Gaussian covariance models (with Thomas S. Richardson). *Journal of Machine Learning Research* **9**, (2008): 893–914.

- 24 Binary models for marginal independence (with Thomas S. Richardson). *Journal of the Royal Statistical Society Series B* **70**, no. 2, (2008): 287–309.
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