Stephan Mandt

Disney Research Pittsburgh
4720 Forbes Avenue
Pittsburgh, PA 15213
www.stephanmandt.com

Professional Appointments

2016— present **Disney Research, Research Scientist**
Leading a machine learning research group of two postdocs and interns
Publishing scientific publications, patents, and promoting technology transfer to various business units including Disney studios and ABC television
Lab Director: Markus Gross

2014–2016 **Columbia University, Postdoctoral Research Scientist**
Carrying out research in machine learning at the Data Science Institute
Focus on scalable probabilistic modeling and stochastic optimization
Advisor: David Blei

2012–2014 **Princeton University, Postdoctoral Fellow**
Princeton Center for Complex Materials
Focus on probabilistic modeling and non-equilibrium statistical physics
Awarded Princeton fellowship for independent research

Education

2008–2012 **University of Cologne, Ph.D. (Magna Cum Laude)**
Theoretical Physics
German National Academic Foundation Fellowship (Studienstiftung des dt. Volkes)
Thesis: "Transport and Non-Equilibrium Dynamics in Optical Lattices"
Advisor: Achim Rosch

2002–2008 **University of Cologne, M.S. and B.S. (With Distinction)**
Studies of Physics and Mathematics
German Diplom degree. GPA: 1.0 (5.0 scale, 1.0 the highest)
Thesis on mathematical physics advised by Martin Zirnbauer

Honors and Awards (Selected)

2016 Best Poster Award, New York Academy of Sciences ML Symposium

2016 NVIDIA Hardware Grant

2015 NSF Support Grant for Junior Researchers

2014-2016 New York City Ascent Fellowship

2013 Institute for Complex Adaptive Matter Travel Award

2012-2014 PCCM Fellowship, Princeton Center for Complex Materials, Princeton University

2010-2012 German National Academic Foundation Fellowship
Most prestigious public fellowship in Germany, supports best 1% of students

Publications

Under Review

2017 **Stochastic Learning on Imbalanced Data: Determinantal Point Processes for Mini-Batch Diversification**,
C. Zhang, H. Kjellström, and ***S. Mandt***,
Submitted to UAI 2017.
`http://arxiv.org/abs/1705.00607`.

2017 **Stochastic Gradient Descent as Approximate Bayesian Inference**,
S. Mandt, *H. Hoffman, and D. Blei*,
Submitted to JMLR.
`http://arxiv.org/abs/1704.04289`.

2016 **Sparse Estimation in a Correlated Probit Model**,
S. Mandt, *F. Wenzel, S. Nakajima, J. Cunningham, C. Lippert, and M. Kloft*,
Submitted to *Machine Learning* (Springer Press).
`http://arxiv.org/abs/1507.04777`.

Peer-Reviewed International Conference Proceedings

2017 **Dynamic Word Embeddings via Skip-Gram Filtering**,
R. Bamler and ***S. Mandt***,
International Conference on Machine Learning (ICML 2017).
Acceptance rate 25%.

2017 **Factorized Variational Autoencoders for Modeling Audience Reactions to Movies**,
Z. Deng, R. Navarathna, P. Carr, ***S. Mandt***, *Y. Yue, I. Matthews, and G. Mori*,
Computer Vision and Pattern Recognition (CVPR 2017).
Acceptance rate 25%.

2016 **Exponential Family Embeddings**,
M. Rudolph, F. Ruiz, ***S. Mandt***, *and D. Blei*,
Neural Information Processing Systems (NIPS 2016)
Acceptance rate 22%.

2016 **A Variational Analysis of Stochastic Gradient Algorithms**,
S. Mandt, *M. Hoffman, and D. Blei*,
Proceedings of the International Conference on Machine Learning (ICML 2016).
Acceptance rate 25%.

2016 **Variational Tempering**,
S. Mandt, *J. McInerney, F. Abrol, R. Ranganath, and D. Blei*,
Proceedings of the 19th International Conference on Artificial Intelligence and Statistics, Journal of Machine Learning Research Conference Proceedings (AISTATS 2016).
Acceptance rate 30%.

2016 **Huber-Norm Regularization for Linear Prediction Models** ,
O. Zadorozhnyi, G. Benecke, ***S. Mandt***, *T. Scheffer, M. Kloft*,
European Conference on Machine Learning (ECML 2016).

2014 **Smoothed Gradients for Stochastic Variational Inference**,
S. Mandt *and D. Blei*,
Advances in Neural Information Processing Systems, 2438-2446 (NIPS 2014).
Acceptance rate 25%.

Journal Papers

2015 **Stochastic differential equations for quantum dynamics of spin-boson networks**,
S. Mandt, *D. Sadri, A. Houck, and H. Tureci*,
New Journal of Physics 17 (5), 053018.

2014 **Damping of Bloch oscillations: variational solutions of the Boltzmann equation beyond linear response**,
S. Mandt,
Physical Review A 90, 053624 (2014).

2013 **Relaxation towards negative temperatures in bosonic systems: Generalized Gibbs ensembles and beyond integrability**,
S. Mandt, *A. Feiguin, S. Manmana*,
Phys. Rev. A **88**, 043643 (2013).

2012 **Fermionic transport in a homogeneous Hubbard model: Out-of-equilibrium dynamics with ultracold atoms**,
U. Schneider, L. Hackermüller, J. P. Ronzheimer, S. Will, S.Braun, T. Best, I. Bloch, E. Demler, ***S. Mandt***, *D. Rasch and A. Rosch*,
Nature Physics **8**, 213-218 (2012).

2011 **Interacting fermionic atoms in optical lattices diffuse symmetrically upwards and downwards in a gravitational potential**,
S. Mandt, *A. Rapp, A. Rosch*,
Phys. Rev. Lett. **106**, 250602 (2011) .

2010 **Equilibration rates and negative absolute temperatures for ultracold atoms in optical lattices**,
A. Rapp, ***S. Mandt***, *A. Rosch*,
Phys. Rev. Lett. **105**, 220405 (2010). Popular media coverage of this article: "How to create temperatures below absolute zero", David Shiga, New Scientist, 2789, p.15 (2010).

2010 **Zooming in on local level statistics by supersymmetric extension of free probability**,
S. Mandt, *M. R. Zirnbauer*,
J. Phys. A: Math. Theor. **42** (2010) 025201 (33pp).

Workshop Papers

2015 **Continuous-Time Limit of Stochastic Gradient Descent Revisited**,
S. Mandt, *M. Hoffman, and D. Blei*,
Proceedings of the 2015 NIPS workshop on optimization (OPT2015).

2015 **Finding Sparse Features in Strongly Confounded Medical Binary Data**,
S. Mandt, *F. Wenzel, S. Nakajima, J. Cunningham, C. Lippert, and M. Kloft*,
NIPS Workshop Machine Learning for Healthcare (MLHC2015). Contributed Talk.

2014 **Probit Regression with Correlated Label Noise: An EM-EP approach**,
S. Mandt, *F. Wenzel, J. Cunningham, and M. Kloft*,
NIPS Workshop on Variational Inference (NIPS 2014).

Technical Reports

2014 **Comment on "Consistent thermostatistics forbids negative absolute temperatures"**,
U. Schneider, ***S. Mandt****, A. Rapp, S. Braun, H. Weimer, I. Bloch, A. Rosch*,
arXiv:1407.4127.

2010 **Breakdown of diffusion: From collisional hydrodynamics to a continuous quantum walk in a homogeneous Hubbard model**,
U. Schneider, L. Hackermüller, J. P. Ronzheimer, S. Will, S.Braun, T. Best, I. Bloch, E. Demler, ***S. Mandt****, D. Rasch and A. Rosch*,
arXiv preprint arxiv:1005.3545.

2007 **Symmetric Spaces Toolkit**, *H. Sebert and S. Mandt*,
http://www.stephanmandt.com/papers/SebertMandt2007.pdf.

Other Publications

2012 **Transport and Non-Equilibrium Dynamics in Optical Lattices**,
S. Mandt, Ph.D. Thesis, University of Cologne 22012.

2013 **Ultrakalt und doch heißer als unendlich heiß**,
S. Mandt, Monthly proceedings of the German Physical Society (in German), Physik Journal, 3/2013.

Service

2016 **Workshop organizer**, NIPS Workshop on Approximate Inference,
as part of Neural Information Processing Systems, 60 paper submissions.

2015 **Workshop organizer**, NIPS Workshop on Approximate Inference,
as part of Neural Information Processing Systems, 32 paper submissions.

journal reviewing
Journal of Machine Learning Research,
Digital Signal Processing,
Physical Review A (atomic physics),
Physical Review E (statistical physics),
Data Mining and Knowledge Discovery.

conference reviewing
Neural Information Processing Systems,
Artificial Intelligence and Statistics,
International Conference of Machine Learning.

Mentoring and Supervision

Postdocs

01/2017– Cheng Zhang,
`https://cheng-zhang.org/`

03/2017– Robert Bamler,
`http://www.thp.uni-koeln.de/~rbamler/`

Interns and Students

2016 Zhiwei Deng, intern, Simon Fraser University

2014-2016 Florian Wenzel, PhD student and intern, Humboldt University Berlin.

2015 Gaurav Ragtah, master student independent study, Columbia University.

2015 Chenzhe Quian, master student independent study, Columbia University.

Invited Talks

2016 CS Colloquium, University of Southern California, California, USA

2016 CS Colloquium, ETH Zurich, Switzerland

2016 ML and Friends Seminar, UMass Amherst, Massachusetts, USA

2016 AI Seminar, Carnegie Mellon University, Pennsylvania, USA

2016 California Institute of Technology, Pasadena, USA

2016 Data Science Colloquium, Rutgers University, Newark, USA

2016 Google Research, Mountain View, USA

2016 Microsoft, Sunnyvale, USA

2016 Computer Science Colloquium, University of Rhode Island, USA

2016 Computer Science Colloquium, University of Colorado at Boulder, USA

2016 National Renewable Energy Laboratory (NREL), Golden, CO, USA

2015 Adobe Research, San Francisco, USA.

2015 Human Longevity Inc., Mountain View, USA.

2015 Schloss Dagstuhl Seminar, Leibniz Center for Informatics, Germany.
Machine Learning with Interdependent and Non-identically Distributed Data

2015 Machine Learning Seminar, Humboldt University Berlin, Germany.

2015 Machine Learning Seminar, Technical University Berlin, Germany.

2015 Machine Learning Seminar, University of British Columbia, Canada.

2015 D-Wave Systems, Burnaby, Canada.

2014 IBM Watson Research Center, Yorktown Heights, USA

2014 Emergent Phenomena in the Dynamics of Quantum Matter, New York, USA.

2013 Theoretical Physics Seminar, University of Otago, Dunedin, New Zealand.

2012 Theoretical Physics Seminar, Princeton University, Princeton, USA.

2011 Finite Temperature Non-Equilibrium Superfluid Systems, Heidelberg, Germany.

2010 Theoretical Physics Seminar, University of Colorado, Boulder, USA.

2010 Theoretical Physics Seminar, Ecole Polytechnique, Palaiseau, France.

Teaching Experience

10/2015	Guest lecture, Title: "Stochastic Gradient Descent", Humboldt University Berlin.
2/2015	Guest lecture, Title: "Variational Inference", Humboldt University Berlin.
Fall 2013	Instructor, Condensed Matter Field Theory, Princeton University Extracurricular undergraduate course.
Spring 2012	Teaching assistant, Computer Physics, University of Cologne.
Fall 2011	Teaching assistant, Mathematical Methods, University of Cologne.
Spring 2011	Teaching assistant, Quantum Field Theory II, University of Cologne.
Fall 2010	Teaching assistant, Quantum Field Theory I, University of Cologne.
Spring 2010	Teaching assistant, Statistical Physics, University of Cologne.
Fall 2009	Teaching assistant, Quantum Physics, University of Cologne.
Spring 2009	Teaching assistant, Electrodynamics, University of Cologne.
Fall 2008	Teaching assistant, Classical Mechanics, University of Cologne.

References

Prof. Dr. David M. Blei, Columbia

Prof. Dr. Marius Kloft, HU Berlin

Dr. Matthew D. Hoffman, Google

Prof. Dr. Achim Rosch, Cologne