

Song Mei

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Education

- Sep. 2014 – **Ph. D.**, *Applied Mathematics and Statistics*, ICME, Stanford University.
Now Advisor: Andrea Montanari.
- Sep. 2010 – **B. S.**, *Mathematics*, Peking University.
Jul. 2014 Thesis advisor: Pingwen Zhang.

Internship

- Jun. 2017 – **Google**, *Data scientist at GDN optimization team*.
Sep. 2017

Research interests

In the intersection of statistics, machine learning, information theory, and computer science. Current projects involves theory of deep learning, high dimensional geometry, and applied Bayesian inference.

Publications

- [1] Song Mei, Theodor Misiakiewicz, and Andrea Montanari. Mean-field theory of two-layers neural networks: dimension-free bounds and kernel limit. *Conference on Learning Theory (COLT)*, 2019.
- [2] Zhou Fan, Song Mei, and Andrea Montanari. Tap free energy, spin glasses, and variational inference. *arXiv preprint arXiv:1808.07890*, 2018.
- [3] Yu Bai and Song Mei. On the connection between sequential quadratic programming and riemannian gradient methods. *arXiv preprint arXiv:1805.08756*, 2018.
- [4] Song Mei, Andrea Montanari, and Phan-Minh Nguyen. A mean field view of the landscape of two-layers neural networks. *Proceedings of the National Academy of Sciences (PNAS)*, 2018.
- [5] Song Mei, Yu Bai, and Andrea Montanari. The landscape of empirical risk for non-convex losses. *Annals of Statistics*, 2018.
- [6] Gerald Ben Arous, Song Mei, Andrea Montanari, and Nica Mihai. The landscape of the spiked tensor model. *To appear in Communications on Pure and Applied Mathematics (CPAM)*, 2017.
- [7] Song Mei, Theodor Misiakiewicz, Andrea Montanari, and Roberto I Oliveira. Solving sdps for synchronization and maxcut problems via the grothendieck inequality. *Conference on Learning Theory (COLT)*, 2017.
- [8] Song Mei and Pingwen Zhang. On a molecular based q-tensor model for liquid crystals with density variations. *Multiscale Modeling & Simulation*, 13(3):977–1000, 2015.

Honors/Awards

- 2019 **National Academy of Science travelling award**.
- 2014 – 2017 **Stanford Graduate Fellowship**.
Awarded to selected entering graduate students to provide greater freedom in choice of research topics and advisors.

TA experiences

- Spring 2018 Stats 300A. Theory of statistics.
Winter 2017 EE 378B. Inference, estimation, and information processing.

Invited talks

- Jan. 2019 **A mean field view of the landscape of two-layers neural networks.**
KITP invited talk, Santa Barbara
- Dec. 2018 **A mean field view of the landscape of two-layers neural networks.**
Workshop in Operations Research and Data Science, Durham
- Sep. 2018 **TAP free energy, spin glasses, and variational inference.**
Berkeley Probability Seminar, Berkeley
- Jul. 2018 **The landscape of rank-constrained SDPs for MaxCut and synchronization problems.**
2018 IMS Annual Meeting on Probability and Statistics, Vilnius
- Oct. 2017 **The landscape of SDPs with Burer-Monteiro factorization.**
Linear Algebra and Optimization Seminar, Stanford University, Stanford
- Sep. 2017 **The landscape of non-convex statical learning problems.**
Operation Research Seminar, Peking University, Beijing.
- Aug. 2017 **The landscape of SDPs with Burer-Monteiro factorization.**
COLT 20 minites talk, University of Amsterdam, Amsterdam.
- Dec. 2016 **The landscape of empirical risk for non-convex losses.**
Bay Area Scientific Computing Day, Stanford University, Stanford.