

# Lei, Qi

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Website: <https://cecilialeiqi.github.io/>

Google Scholar: <https://scholar.google.com/citations?user=kG0gaowAAAAJ&hl=en>

Email: [qilei@princeton.edu](mailto:qilei@princeton.edu)

**EMPLOYMENT** *Princeton University, NJ, United States* July 2020 - Present

- Postdoc Research Associate (CIFellow), Electrical Engineering Department
- Postdoc Mentor: Jason D. Lee

**EDUCATION** *University of Texas at Austin, TX, United States* August 2014 - May 2020

- Ph.D., Oden Institute for Computational Sciences and Engineering
- Advisors: Inderjit S. Dhillon and Alexandros G. Dimakis

*Zhejiang University, Zhejiang, China* Sep 2010 - June 2014

- B.S., School of Mathematics (with honors), Chu Kochen Honors (GPA 3.92/4.0, rank 1<sup>st</sup>)
- Advisor: Qunsheng Peng, State Key Lab of CAD&CG.

**AWARDS and RECOGNITIONS**

- Computing Innovation Fellowship Computing Research Association, 2020-2022
- Simons-Berkeley Research Fellowship Simons Institute, 2019 summer
- The National Initiative for Modeling and Simulation Research Fellowship UT Austin, 2014-2018
- Rising Star for EECS UIUC, 2019
- Rising Star for Computational and Data Science UT Austin, 2020
- Gold medal (5<sup>th</sup> place) in China Girls Math Olympiad (CGMO, an international competition with a proof-based format similar to the International Math Olympiad) China, 2009
- Meritorious Winner (First Prize) for The Mathematical Contest in Modeling (MCM) COMAP, 2014

**PUBLICATIONS**

1. Xiao Wang, **Qi Lei**, Ioannis Panageas. “Fast Convergence of Langevin Dynamics on Manifold: Geodesics meet Log-Sobolev”, *To appear at NeurIPS 2020*
2. Jay Whang, Qi Lei, Alexandros G. Dimakis. “Compressed Sensing with Invertible Generative Models and Dependent Noise”, *To appear at NeurIPS Workshop on Deep Learning and Inverse Problems, 2020*
3. Jiacheng Zhuo, **Qi Lei**, Alexandros G. Dimakis, Constantine Caramanis. “Communication-Efficient Asynchronous Stochastic Frank-Wolfe over Nuclear-norm Ball”, *The 23rd International Conference on Artificial Intelligence and Statistics, 2020*
4. **Qi Lei**, Jason Lee, Alexandros G. Dimakis, Contantinos Daskalakis. “SGD Learns One-Layer Networks in WGANs”, *International Conference of Machine Learning (ICML) 2020*
5. **Qi Lei**, Jiacheng Zhuo, Constantine Caramanis, Inderjit S. Dhillon, Alexandros G. Dimakis. “Primal-Dual Block Frank-Wolfe”, *Proc. of Neural Information Processing Systems (NeurIPS), 2019: 13866-13875*

6. **Qi Lei**, Ajil Jalal, Inderjit S. Dhillon, Alexandros G. Dimakis. “Inverting Deep Generative models, One layer at a time”, *Proc. of Neural Information Processing Systems (NeurIPS) 2019*: 13910-13919
7. **Qi Lei**, Jinfeng Yi, Roman Vaculin, Lingfei Wu, Inderjit S. Dhillon. “Similarity Preserving Representation Learning for Time Series Analysis”, *The 28th International Joint Conference on Artificial Intelligence (IJCAI), 2019*: 2845-2851
8. **Qi Lei**, Lingfei Wu, Pin-Yu Chen, Alexandros G. Dimakis, Inderjit S. Dhillon, Michael Witbrock. “Discrete Adversarial Attacks and Submodular Optimization with Applications to Text Classification”, *Systems and Machine Learning (sysML), 2019* (covered by Nature Story )
9. Zhewei Yao, Amir Gholami, **Qi Lei**, Kurt Keutzer, Michael W. Mahoney. “Hessian-based Analysis of Large Batch Training and Robustness to Adversaries”, *Neural Information Processing Systems (NIPS), 2018*: 4954-4964
10. Jiong Zhang, **Qi Lei**, Inderjit S. Dhillon. “Stabilizing Gradients for Deep Neural Networks via Efficient SVD Parameterization”, *International Conference of Machine Learning (ICML), 2018*: 5801-5809
11. Lingfei Wu, Ian En-Hsu Yen, Jinfeng Yi, Fangli Xu, **Qi Lei**, Michael Witbrock. “Random Warping Series: A Random Features Method for Time-Series Embedding”, *AISTATS 2018*: 793-802
12. Hsiang-fu Yu, Cho-Jui Hsieh, **Qi Lei**, Inderjit S. Dhillon. “A Greedy Approach for Budgeted Maximum Inner Product Search”, *Neural Information Processing Systems (NIPS), 2017*: 5453-5462
13. **Qi Lei**, Enxu Yen, Chao-yuan Wu, Inderjit S. Dhillon, Pradeep Ravikumar. “Doubly Greedy Primal-Dual Coordinate Methods on Sparse Empirical Risk Minimization”, *International Conference of Machine Learning (ICML), 2017*: 2034-2042
14. Rashish Tandon, **Qi Lei**, Alexandros G. Dimakis, Nikos Karampatziakis, “Gradient Coding: Avoiding Stragglers in Distributed Learning”, *International Conference of Machine Learning (ICML), 2017*: 3368-3376
15. **Qi Lei**, Kai Zhong, Inderjit S. Dhillon. “Coordinate-wise Power Method”, *Neural Information Processing System(NIPS), 2016*: 2056-2064
16. Arnaud Vandaele, Nicolas Gillis, **Qi Lei**, Kai Zhong, Inderjit S. Dhillon. “Coordinate Descent Methods for Symmetric Nonnegative Matrix Factorization”, *IEEE Transactions on Signal Processing*, 64.21 (2016): 5571-5584

## TEACHING

- Department of Electrical and Computer Engineering, UT Austin*      Fall 2019
- Scalable Machine Learning: *Teaching Assistant*
- Oden Institute for Computational Engineering and Sciences, UT Austin*      Fall 2015
- Mathematical Methods in Applied Engineering and Sciences: *Instructor Intern*

## EXPERIENCE

- Institute for Advanced Study, Princeton, NJ, United States*      September 2019 - July 2020
- Visiting Graduate Student for the “Special Year on Optimization, Statistics, and Theoretical Machine Learning”
- Simons Institute, Berkeley, CA, United States*      May 2019 - August 2019
- Research Fellow for the Foundations of Deep Learning Program
- Facebook/Photo&Video Search*      June 2018 - September 2018

- Explored offline/online evaluation gaps by estimating expected number of clicks based on historical logging data.

*Amazon/A9 Product Search*

May 2017 - August 2017

- Inline search suggestions: used deep learning methods for NLP user search tasks.

*Amazon Web Services (AWS Deep Learning Team)*

January 2017 - April 2017

- Documentations for MXNet: a deep learning framework designed for both efficiency and flexibility.

*IBM Thomas J. Watson Research Center*

May 2016 - October 2016

- Partnered with one of the largest American financial companies on a challenge problem of predicting its clients' propensity of trading options
- Create World of Watson Session recommendation system:  
<https://myibm.ibm.com/events/wow/watson/>

## SERVICE

*Conference Reviewer:* MLSys (PC'21, 20), STOC (20), NeurIPS (16,17,18,19,20), ICML (18,19,20), ICLR (18,19,20,21), AISTATS (18,19,20,21), AAAI (20,21), ACML (19), and more

*Journal Reviewer:* MOR (19), TNNLS (19), TKDE (19), ISIT (17,18), THS (17), IT (16,17), and more

## PATENTS

- "Method and System for General and Efficient Time Series Representation Learning via Dynamic Time Warping."  
**Q. Lei**, J. Yi, R. Vaculin, and W. Sun
- "Real-Time Cold Start Recommendation and Rationale within a Dialog System".  
**Q. Lei**, J. Yi, R. Vaculin, M. Pietro

## INVITED TALKS

- "Few-Shot Learning via Learning the Representation, Provably."  
IAS, Princeton, NJ & Simons Institute Reunion & UC Berkeley, 2020
- "Predicting What You Already Know Helps: Provable Self-Supervised Learning."  
One-World ML seminar & UW-Madison, 2020
- "Deep Generative models and Inverse Problems."  
Minisymposium on Machine Learning for Solving Partial Differential Equations and Inverse Problems, 2019 SIAM Texas-Louisiana Section, Dallas, TX, USA, 2019
- "Discrete Adversarial Attacks and Submodular Optimization with Applications to Text Classification."  
Simons-Berkeley Fellows Talk, Berkeley, CA, USA & SysML19, Stanford, CA, USA, 2019
- "Recent Advances in Primal-Dual Coordinate Methods for ERM."  
Minisymposium on Recent Progress in Coordinate-wise Descent Methods, SIAM Conference on Computational Science and Engineering, Spokane, WA, USA, 2019

- “Coordinate Descent Methods for Matrix Factorization.”  
Minisymposium on Recent Advances in Nonnegative Matrix Factorization, SIAM  
Annual Meeting, Boston, USA, 2016

**PROGRAMMING  
SKILLS**

C/C++(proficient), Python(proficient), Matlab(proficient), C#(prior experience)

Familiar with Deep Learning packages(Pytorch, Tensorflow, Theano, MXNet)