

Yuchen Zhang

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Education

University of California, Berkeley Doctor of Philosophy in Computer Science Advised by Michael I. Jordan and Martin J. Wainwright	2011 - 2016
University of California, Berkeley Master of Arts in Statistics	2011 - 2013
Tsinghua University Bachelor of Engineering in Computer Science Supervised by Andrew C. Yao	2007 - 2011

Employment

Post-doc Researcher at Stanford University Supervisor: Percy Liang and Moses Charikar	2016 - Now
Intern at Baidu Project: burst detection in web search	Winter, 2015
Intern at Microsoft Research Redmond Project: convex optimization	Summer, 2014
Intern at Google Mountain View Project: personalized recommender systems	Summer, 2013
Intern at Microsoft Research Asia Project: click modeling for web search and online advertising	2010 - 2011

Awards & Honors

2017	Best Paper Award, Conference on Learning Theory (COLT).
2016	Outstanding Reviewer Award, International Conference on Machine Learning (ICML).
2015	Baidu Fellowship.
2013	Microsoft Research PhD Fellowship Finalist.
2011	UC Berkeley EECS Department Fellowship.
2011	Outstanding Undergraduate Dissertation Award.
2011	Boeing Scholarship.
2010	Tencent Scholarship for Excellent Academic Performance.
2006	Silver Medal in Asian Physics Olympiad.
2006	Gold Medal in National Physics Olympiad (5 th among 400,000 participants).

Research

My research explores the frontiers of Artificial Intelligence by developing algorithms, building systems and proposing fundamental theory. Below is a list of projects that I have been working on (with publication

references):

Natural language processing

- Semantic parsing for question answering systems [C1].

Machine learning and optimization

- Deep learning and non-convex optimization [C2,C3,C4,C5,C6].
- Convex optimization [J1,C9].
- Crowdsourcing [J4,C10].
- Personalized recommender systems [C12].
- Click modeling for web search and online advertising [C16,C17,C18,C19,C20,C21] (*Improved +0.8% NDCG on Microsoft Bing*).

Distributed computing

- Distributed algorithms for machine learning [J5,J6,C7,C8,C15].
- Fundamental trade-offs between communication, computation and statistical accuracy [C11,C13,M2].
- Programming interface for parallelizing stochastic algorithms [M1] (*open source project*).

Other projects

- Theoretical statistics [J2,J3].
- Theoretical computer science [J7,C22].

Manuscripts

- [M1] **Y. Zhang** and MI. Jordan. Splash: User-friendly Programming Interface for Parallelizing Stochastic Algorithms. *arXiv:1506.07552*, 2015.
- [M2] J. Duchi, MI. Jordan, M. Wainwright and **Y. Zhang** (alpha-beta order). Optimality Guarantees for Distributed Statistical Estimation. *arXiv:1405.0782*, 2014.

Journal Publications

- [J1] **Y. Zhang** and L. Xiao. Stochastic Primal-Dual Coordinate Method for Regularized Empirical Risk Minimization. *Journal of Machine Learning Research*.
- [J2] **Y. Zhang**, M. Wainwright and MI. Jordan. Optimal prediction for sparse linear models? Lower bounds for coordinate-separable M-estimators. *Electronic Journal of Statistics*.
- [J3] X. Chen, A. Guntuboyina and **Y. Zhang** (alpha-beta order). On Bayes Risk Lower Bounds. *Journal of Machine Learning Research*.
- [J4] **Y. Zhang**, X. Chen, D. Zhou and MI. Jordan. Spectral Methods meet EM: A Provably Optimal Algorithm for Crowdsourcing. *Journal of Machine Learning Research*.
- [J5] **Y. Zhang**, J. Duchi and M. Wainwright. Divide and Conquer Kernel Ridge Regression: A Distributed Algorithm with Minimax Optimal Rates. *Journal of Machine Learning Research*.
- [J6] **Y. Zhang**, J. Duchi and M. Wainwright. Communication-Efficient Algorithms for Statistical Optimization. *Journal of Machine Learning Research*.
- [J7] **Y. Zhang** and X. Sun. The Antimagicness of the Cartesian Product of Graphs. *Theoretical Computer Science*.

Conference Publications

- [C1] **Y. Zhang**, P. Pasupat, P. Liang. Macro Grammars and Holistic Triggering for Efficient Semantic Parsing. *Empirical Methods on Natural Language Processing (EMNLP)*, 2017.
- [C2] **Y. Zhang**, P. Liang, M. Wainwright. Convexified Convolutional Neural Networks. *International Conference on Machine Learning (ICML)*, 2017.

- [C3] **Y. Zhang**, P. Liang, M. Charikar. A Hitting Time Analysis of Stochastic Gradient Langevin Dynamics. *Conference on Learning Theory (COLT)*, 2017 (**Best paper award**).
- [C4] **Y. Zhang**, JD. Lee, M. Wainwright and MI. Jordan. On the Learnability of Fully-connected Neural Networks. *Artificial Intelligence and Statistics (AISTATS)*, 2017.
- [C5] C. Jin, **Y. Zhang**, S. Balakrishnan, M. Wainwright, MI. Jordan. Local Maxima in the Likelihood of Gaussian Mixture Models: Structural Results and Algorithmic Consequences. *Neural Information Processing Systems (NIPS)*, 2016.
- [C6] **Y. Zhang**, JD. Lee, MI. Jordan. ℓ_1 -regularized Neural Networks are Improperly Learnable in Polynomial Time. *International Conference on Machine Learning (ICML)*, 2016.
- [C7] **Y. Zhang**, M. Wainwright and MI. Jordan. Distributed Estimation of Generalized Matrix Rank: Efficient Algorithms and Lower Bounds. *International Conference on Machine Learning (ICML)*, 2015.
- [C8] **Y. Zhang** and L. Xiao. DiSCO: Communication-Efficient Distributed Optimization of Self-Concordant Loss. *International Conference on Machine Learning (ICML)*, 2015.
- [C9] **Y. Zhang** and L. Xiao. Stochastic Primal-Dual Coordinate Method for Regularized Empirical Risk Minimization. *International Conference on Machine Learning (ICML)*, 2015.
- [C10] **Y. Zhang**, X. Chen, D. Zhou and MI. Jordan. Spectral Methods meet EM: A Provably Optimal Algorithm for Crowdsourcing. *Neural Information Processing Systems (NIPS)*, 2014.
- [C11] **Y. Zhang**, M. Wainwright and MI. Jordan. Lower Bounds on the Performance of Polynomial-time Algorithms for Sparse Linear Regression. *Conference on Learning Theory (COLT)*, 2014.
- [C12] **Y. Zhang**, A. Ahmed, V. Josifovski and A. Smola. Taxonomy Discovery for Personalized Recommendation. *ACM International Conference on Web Search and Data Mining (WSDM)*, 2014.
- [C13] **Y. Zhang**, J. Duchi, M. Wainwright and MI. Jordan. Information-theoretic Lower Bounds for Distributed Statistical Estimation with Communication Constraints. *Neural Information Processing Systems (NIPS)*, 2013.
- [C14] **Y. Zhang**, J. Duchi and M. Wainwright. Divide and Conquer Kernel Ridge Regression. *Conference on Learning Theory (COLT)*, 2013.
- [C15] **Y. Zhang**, J. Duchi and M. Wainwright. Communication-Efficient Algorithms for Statistical Optimization. *Neural Information Processing Systems (NIPS)*, 2012.
- [C16] W. Chen, D. Wang, **Y. Zhang** and Q. Yang. Understanding Click Noise: A Noise-aware Click Model for Web Search. *ACM International Conference on Web Search and Data Mining (WSDM)*, 2012.
- [C17] **Y. Zhang**, W. Chen and D. Wang, Q. Yang. User-click Modeling for Understanding and Predicting Search-behavior. *ACM SIGKDD Conference on Knowledge Discovery and Data Mining (KDD)*, 2011.
- [C18] B. Hu, **Y. Zhang**, G. Wang, Q. Yang, W. Chen. Characterize Search Intent Diversity into Click Models. *International World Wide Web Conference (WWW)*, 2011.
- [C19] **Y. Zhang**, D. Wang, G. Wang, W. Chen, Z. Zhang, B. Hu and L. Zhang. Learning Click Model via Probit Bayesian Inference. *ACM International Conference on Information and Knowledge Management (CIKM)*, 2010.
- [C20] D. Wang, W. Chen, G. Wang, **Y. Zhang** and B. Hu. Explore Click Models for Search Ranking. *ACM International Conference on Information and Knowledge Management (CIKM)*, short paper, 2010.
- [C21] F. Zhong, D. Wang, G. Wang, W. Chen, **Y. Zhang**, Z. Chen and H. Wang. Incorporating Post-Click Behaviors Into a Click Model. *Annual International ACM SIGIR Conference (SIGIR)*, 2010.
- [C22] **Y. Zhang** and L. Zhang. Extracting Independent Rules: a New Perspective of Boosting. *International Symposium on Artificial Intelligence and Mathematics (ISAIM)*, 2010.

Teaching

Graduate Student Instructor, Introduction to machine learning, UC Berkeley

Spring, 2015

Graduate Student Instructor, Randomized algorithms for matrices and data, UC Berkeley

Fall, 2013

Service

Journal Reviewer: Journal of Machine Learning Research, Annals of Statistics, Mathematical Programming, ACM Transactions on the Web.

Conference Reviewer: ICML (2013 -), NIPS (2013 -), AISTAT (2015 -), IJCAI (2015 -).

References

Michael I. Jordan

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EECS and Statistics, UC Berkeley
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Lin Xiao

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Machine Learning Department
Microsoft Research Redmond
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Martin J. Wainwright

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Percy Liang

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