

# JERRY ZHENG LI

## ADDRESS

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## CONTACT

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## EDUCATION

### Massachusetts Institute of Technology

Ph.D. candidate, June 2018 (expected)  
Advisor: Ankur Moitra  
Electrical Engineering and Computer Science

### Massachusetts Institute of Technology

S.M., September 2014  
Thesis: The SprayList: A Scalable Relaxed Priority Queue  
Advisor: Nir Shavit  
Electrical Engineering and Computer Science

### University of Washington

B.S., magna cum laude, May 2013  
Computer Science & Engineering, Mathematics

## PUBLICATIONS

(All authors are alphabetical unless stated otherwise)

### Manuscripts

#### Tight Bounds for Learning Mixture Models via PCA

Jerry Li  
in preparation

#### Differentially Private Estimation in High Dimensions

Gautam Kamath, Jerry Li, Vikrant Singhal, Jonathan Ullman  
in preparation

#### Sever: A Robust Meta-Algorithm for Stochastic Optimization

Ilias Diakonikolas, Daniel Kane, Gautam Kamath, Jerry Li, Jacob Steinhardt, Alistair Stewart  
in preparation

#### Fast and Sample-Efficient Algorithms for Learning Multidimensional Histograms

Ilias Diakonikolas, Jerry Li, Ludwig Schmidt  
manuscript

#### Asynchronous Balanced Allocations with Applications to Approximate Counting

Dan Alistarh, Justin Kopinsky, Jerry Li, Giorgi Nadiradze  
manuscript

#### Towards Understanding the Dynamics of Generative Adversarial Networks

Jerry Li, Aleksander Mądry, John Peebles, Ludwig Schmidt  
in submission to ICLR 2018

### Conference papers

#### Mixture Models, Robustness, and Sum of Squares Proofs

Samuel B. Hopkins and Jerry Li  
to appear, Proceedings of the 50th ACM Symposium on Theory of Computing (STOC 2018)

**Robustly Learning a Gaussian in High Dimensions: Getting Optimal Error, Efficiently**

Ilias Diakonikolas, Gautam Kamath, Daniel M. Kane, Jerry Li, Ankur Moitra, Alistair Stewart  
Proceedings of the 29th Annual ACM-SIAM Symposium on Discrete Algorithms (SODA 2018)

**Communication-Efficient Distributed Learning of Discrete Distributions**

Ilias Diakonikolas, Elena Grigorescu, Jerry Li, Abhiram Natarajan, Krzysztof Onak, Ludwig Schmidt  
Advances in Neural Information Processing Systems 30 (NIPS 2017)

**Oral Presentation**

**QSGD: Communication-Optimal Stochastic Gradient Descent, with Applications to Training Neural Networks**

Dan Alistarh, Demjan Grubić, Jerry Li, Ryota Tomioka, Milan Vojnovic  
Preliminary version appeared in Optimization for Machine Learning 2016  
Advances in Neural Information Processing Systems 30 (NIPS 2017)

**Spotlight Presentation**

**Being Robust (in High Dimensions) Can Be Practical**

Ilias Diakonikolas, Gautam Kamath, Daniel M. Kane, Jerry Li, Ankur Moitra, Alistair Stewart  
Proceedings of the 34th International Conference on Machine Learning (ICML 2017)

**ZipML: An End-to-end Bitwise Framework for Dense Generalized Linear Models**

(by contribution) Hantian Zhang\*, Jerry Li\*, Kaan Kara, Dan Alistarh, Ji Liu, Ce Zhang

\*equal contribution

Proceedings of the 34th International Conference on Machine Learning (ICML 2017)

**The Power of Choice in Priority Scheduling**

Dan Alistarh, Justin Kopinsky, Jerry Li, Giorgi Nadiradze  
Proceedings of the 25th ACM Symposium on Principles of Distributed Computing (PODC 2017)

**Robust Sparse Estimation Tasks in High Dimensions**

Jerry Li

Proceedings of the 30th Annual Conference on Learning Theory (COLT 2017)  
Merged with *Computationally Efficient Robust Estimation of Sparse Functionals*

**Robust Proper Learning for Mixtures of Gaussians via Systems of Polynomial Inequalities**

Jerry Li, Ludwig Schmidt

Proceedings of the 30th Annual Conference on Learning Theory (COLT 2017)

**Sample Optimal Density Estimation in Nearly-Linear Time**

Jayadev Acharya, Ilias Diakonikolas, Jerry Li, Ludwig Schmidt  
Proceedings of the 28th Annual ACM-SIAM Symposium on Discrete Algorithms (SODA 2017)

**Robust Estimators in High Dimensions without the Computational Intractability**

Ilias Diakonikolas, Gautam Kamath, Daniel M. Kane, Jerry Li, Ankur Moitra, Alistair Stewart  
Proceedings of the 57th Annual IEEE Symposium on Foundations of Computer Science (FOCS 2016)

**Invited to the SIAM Journal on Computing Special Issue for FOCS 2016**

**Invited to Highlights of Algorithms 2017 (HALG 2017)**

**Fast Algorithms for Segmented Regression**

Jayadev Acharya, Ilias Diakonikolas, Jerry Li, Ludwig Schmidt

Proceedings of the 33th International Conference on Machine Learning (ICML 2016)

**Replacing Mark Bits with Randomness in Fibonacci Heaps**

Jerry Li, John Peebles

Proceedings of the 42nd International Colloquium on Automata, Languages, and Programming (ICALP 2015)

**Fast and Near-Optimal Algorithms for Approximating Distributions by Histograms**

Jayadev Acharya, Ilias Diakonikolas, Chinmay Hegde, Jerry Li, Ludwig Schmidt.

Proceedings of the 23rd ACM Symposium on Principles of Database Systems (PODS 2015)

**The SprayList: A Scalable Relaxed Priority Queue**

Dan Alistarh, Justin Kopinsky, Jerry Li, Nir Shavit  
Proceedings of 20th ACM SIGPLAN Symposium on Principles and Practice of Parallel Programming (PPoPP 2015)  
**Best Artifact Award**  
(see also my master's thesis)

**On the Importance of Registers for Computability**

Rati Gelashvili, Mohsen Ghaffari, Jerry Li, Nir Shavit  
Proceedings of the 18th International Conference on Principles of Distributed Systems (OPODIS 2014)

The following two papers are subsumed by the journal paper *Exact Model Counting of Query Expressions: Limitations of Propositional Methods*:

**Model Counting of Query Expressions: Limitations of Propositional Methods**

Paul Beame, Jerry Li, Sudeepa Roy, Dan Suciu.  
Proceedings of the 17th International Conference on Database Theory (ICDT 2014)

**Lower bounds for exact model counting and applications in probabilistic databases**

Paul Beame, Jerry Li, Sudeepa Roy, Dan Suciu.  
Proceedings of the 29th Conference on Uncertainty in Artificial Intelligence (UAI 2013)

**Plenary Presentation**

**Journal papers**

**Robust Estimators in High Dimensions without the Computational Intractability**

Ilias Diakonikolas, Gautam Kamath, Daniel M. Kane, Jerry Li, Ankur Moitra, Alistair Stewart  
in revision, SIAM Journal of Computing

**Exact Model Counting of Query Expressions: Limitations of Propositional Methods**

Paul Beame, Jerry Li, Sudeepa Roy, Dan Suciu.  
to appear, ACM Transactions on Database Systems

**THESIS**

**The SprayList: A Scalable Relaxed Priority Queue**

Jerry Li  
Masters thesis, 2015

**PATENTS**

**Efficient training of neural networks**

Dan Alistarh, Jerry Li, Ryota Tomioka, Milan Vojnovic  
in submission

**TALKS**

**Robustly Learning a Gaussian in High Dimensions: Getting Optimal Error, Efficiently**

Symposium on Discrete Algorithmics, January 2018

**Mixture Models, Robustness, and Sum-of-Squares Proofs**

Microsoft Research Redmond, December 2017  
MIT Algorithms & Complexity Seminar, November 2017

**QSGD: Communication-Efficient SGD via Gradient Quantization and Encoding**

Neural Information Processing Systems, December 2017

**Being Robust (in High Dimensions) can be Practical**

International Conference on Machine Learning, August 2017

**Robust Property Learning for Mixtures of Gaussians via Systems of Polynomial Inequalities**

Conference on Learning Theorem, July 2017

**Efficient Robust Sparse Estimation in High Dimensions**

Conference on Learning Theorem, July 2017. Joint with Simon Du

## **Robust Estimators in High Dimensions without the Computational Intractability**

TCS+, December 2016 (**Invited**)  
Foundations of Computer Science, October 2016  
ETH Theory Seminar, August 2016  
University of Washington Theory Lunch, July 2016  
MIT Algorithms and Complexity Seminar, June 2016

## **Quantized Stochastic Gradient Descent**

MIT ML Tea, September 2015

## **Fast Algorithms for Segmented Regression**

International Conference on Machine Learning, July 2016

## **Fast and Near-Optimal Algorithms for Approximating Distributions by Histograms**

Symposium on Principles of Database Systems, June 2015

## **Model Counting of Query Expressions: Limitations of Propositional Methods**

International Conference on Database Theory, March 2014

## **TEACHING EXPERIENCE**

<b>Teaching Assistant</b> 6.852: Distributed Algorithms	Massachusetts Institute of Technology	Fall 2014 Fall 2014
<b>Teaching Assistant</b> Mathematics REU MATH 334/5/6: Advanced Accelerated Second Year Honors Calculus CSE 373: Algorithms and Data Structures CSE 344: Databases	University of Washington	Spring 2012 - Spring 2013 Summer 2013 Fall 2012-Spring 2013 Spring 2012 Winter 2012

## **RELEVANT COURSEWORK**

MIT: Graph Theory and Combinatorics, Topics in Combinatorics, Machine Learning, Distributed Systems, Advanced Algorithms, Distributed Algorithms, Multicore Programming, Randomness and Computation, Algorithmist's Toolkit.

UW: Randomized Algorithms, Databases, Advanced Real Analysis, Advanced Complex Analysis, Algebraic and Smooth Topology, Continuous and Discrete Probability, Group Theory.

## **HONORS AND AWARDS**

NSF Graduate Research Fellowship	2014-
NDSEG Graduate Research Fellowship (declined)	2014
MIT Akamai Presidential Graduate Fellowship	September 2013 - May 2014
University of Washington Outstanding Graduating Senior in Mathematics	May 2013
Microsoft Endowed Scholarship	2013-2014
University of Washington Gullickson Award for Outstanding Junior in Mathematics	May 2012
Jerre Noe Endowed Scholarship	2012-2013
Meritorious Winner Mathematical Contest in Modeling	Fall 2012
University of Washington Outstanding Second Year Student in Mathematics	May 2010
Outstanding Winner Mathematical Contest in Modeling	Fall 2010
National Merit Scholarship Finalist	Fall 2008
Early Entrance Program Scholarship	Fall 2008
Dean's list at University of Washington	Fall 2009 - Spring 2013

## **SERVICE**

Organizer of MIT Theory Lunch (Fall 2013 - Summer 2014)

External reviewer for: STOC, FOCS, SODA, COLT, ITCS, RANDOM, ICALP, NIPS, ICM, ICDT, DISC, JMLR

## **REFERENCES**

available upon request