

Yuan Zhou

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- CURRENT POSITION** Assistant Professor
Computer Science Department
Indiana University at Bloomington
Lindley Hall
Bloomington IN 47405, USA
- EDUCATION** **Ph.D. in Theoretical Computer Science, Carnegie Mellon University**
Pittsburgh, Pennsylvania, USA, 2009 – 2014
Advisors: Prof. Venkatesan Guruswami and Prof. Ryan O'Donnell
- M.Sc. in Computer Science, Carnegie Mellon University**
Pittsburgh, Pennsylvania, USA, 2009 – 2013
- B.Eng. in Computer Science, Tsinghua University** *Beijing, China, 2005 – 2009*
Student in Tsinghua University – Microsoft CS Pilot Class
GPA: 94.1/100, Rank 1/130
- RESEARCH INTERESTS** My research interests encompass both *theoretical computer science* and *operations research*, with an emphasis on the following topics.
- Analysis of linear programming/semidefinite programming relaxations
 - Discrete optimization problems
 - Approximation algorithms and hardness of approximation
 - Harmonic analysis of discrete functions
 - Process flexibility
 - Decision under uncertainty (e.g. bandit decision problems) with applications to crowdsourcing
- PROFESSIONAL EXPERIENCE** **Instructor in Applied Mathematics at Massachusetts Institute of Technology**
2014.08 – 2016.06
- PUBLICATIONS** Note: in papers related to theoretical computer science and operations research, authors are usually listed in alphabetical order.
- MANUSCRIPTS** **Adaptive Multiple-Arm Identification**
Jiecao Chen, Xi Chen, Qin Zhang, Yuan Zhou
Manuscript
- Optimal Design of Process Flexibility for General Production Systems**
Xi Chen, Tengyu Ma, Jiawei Zhang, Yuan Zhou
Submitted to *Operations Research*, in minor revision
- JOURNAL PUBLICATIONS** **Optimal Sparse Designs for Process Flexibility via Probabilistic Expanders**
Xi Chen, Jiawei Zhang, Yuan Zhou
Operations Research 63-5 (2015), pp. 1159–1176
- Hardness of Max-2Lin and Max-3Lin over integers, reals, and large cyclic groups**
Ryan O'Donnell, Yi Wu, Yuan Zhou
ACM Transactions on Computation Theory 7(2), Article 9 (May 2015)
- Constant Factor Lasserre Gaps for Graph Partitioning Problems**
Venkatesan Guruswami, Ali Kemal Sinop, Yuan Zhou

SIAM Journal on Optimization 24-4 (2014), pp. 1698–1717

Approximation Algorithms and Hardness of the k -Route Cut Problem

Julia Chuzhoy, Yury Makarychev, Aravindan Vijayaraghavan, Yuan Zhou

To appear in *ACM Transactions on Algorithms*, preliminary version appeared in *SODA 2012*

Optimal lower bounds for locality sensitive hashing (except when q is tiny)

Ryan O'Donnell, Yi Wu, Yuan Zhou

ACM Transactions on Computation Theory 6(1), Article 5 (March 2014)

Tight Bounds on the Approximability of Almost-Satisfiable Horn SAT and Exact Hitting Set

Venkatesan Guruswami and Yuan Zhou

Theory of Computing 8, pp. 239–267 (2012)

Surviving Rates of Graphs with Bounded Treewidth for the Firefighter Problem

Leizhen Cai, Yongxi Cheng, Elad Verbin, Yuan Zhou

SIAM Journal on Discrete Mathematics 24(4), pp. 1322–1335 (2010)

CONFERENCE
PUBLICATIONS

Parameterized Algorithms for Constraint Satisfaction Problems Above Average with Global Cardinality Constraints

Xue Chen, Yuan Zhou

SODA 2017, Proceedings of the 28th annual ACM-SIAM Symposium on Discrete Algorithms

Satisfiability of Ordering CSPs Above Average Is Fixed-Parameter Tractable

Konstantin Makarychev, Yury Makarychev, Yuan Zhou

FOCS 2015, Proceedings of the 56th Annual Symposium on Foundations of Computer Science

Deterministic Coupon Collection and Better Strong Dispersers

Raghu Meka, Omer Reingold, Yuan Zhou

RANDOM 2014, the 18th International Workshop on Randomization and Computation

Optimal PAC Multiple Arm Identification with Applications to Crowdsourcing

Yuan Zhou, Xi Chen, Jian Li

ICML 2014, the 30th International Conference on Machine Learning

Optimal strong parallel repetition for projection games on low threshold rank graphs

Madhur Tulsiani, John Wright, Yuan Zhou

ICALP 2014, Proceedings of the 41st International Colloquium on Automata, Languages and Programming

Locally Testable Codes and Cayley Graphs

Parikshit Gopalan, Salil Vadhan, Yuan Zhou

ITCS 2014, Proceedings of the 5th Innovations in Theoretical Computer Science conference

Approximation Schemes via Sherali-Adams Hierarchy for Dense Constraint Satisfaction Problems and Assignment Problems

Yuichi Yoshida, Yuan Zhou

ITCS 2014, Proceedings of the 5th Innovations in Theoretical Computer Science conference

Hardness of Robust Graph Isomorphism, Lasserre Gaps, and Asymmetry of Random Graphs

Ryan O'Donnell, John Wright, Chenggang Wu, Yuan Zhou

SODA 2014, Proceedings of the 25th annual ACM-SIAM Symposium on Discrete Algorithms

Hypercontractive inequalities via SOS, with an application to Vertex-Cover

Manuel Kauers, Ryan O'Donnell, Li-Yang Tan, Yuan Zhou

SODA 2014, Proceedings of the 25th annual ACM-SIAM Symposium on Discrete Algorithms

Approximability and proof complexity

Ryan O'Donnell, Yuan Zhou

SODA 2013, Proceedings of the 24th annual ACM-SIAM Symposium on Discrete Algorithms

Approximating bounded occurrence ordering CSPs

Venkatesan Guruswami, Yuan Zhou

APPROX 2012, Proceedings of the 15th International Workshop on Approximation, Randomization, and Combinatorial Optimization

Hypercontractivity, Sum-of-Squares Proofs, and their Applications

Boaz Barak, Fernando Brandão, Aram Harrow, Jonathan Kelner, David Steurer, Yuan Zhou

STOC 2012, Proceedings of the 44th annual ACM Symposium on Theory of Computing Conference

Invited to *SIAM Journal on Computing*

Linear programming, width-1 CSPs, and robust satisfaction

Gabor Kun, Ryan O'Donnell, Suguru Tamaki, Yuichi Yoshida, Yuan Zhou

ITCS 2012, Proceedings of the 3rd Innovations in Theoretical Computer Science conference

Polynomial integrality gaps for strong SDP relaxations of Densest k -Subgraph

Aditya Bhaskara, Moses Charikar, Venkatesan Guruswami, Aravindan Vijayaraghavan, Yuan Zhou

SODA 2012, Proceedings of the 23th annual ACM-SIAM Symposium on Discrete Algorithms

Approximation Algorithms and Hardness of the k -Route Cut Problem

Julia Chuzhoy, Yury Makarychev, Aravindan Vijayaraghavan, Yuan Zhou

SODA 2012, Proceedings of the 23th annual ACM-SIAM Symposium on Discrete Algorithms

Invited to *ACM Transactions on Algorithms*

Black-box reduction in mechanism design

Zhiyi Huang, Lei Wang, Yuan Zhou

APPROX 2011, Proceedings of the 14th International Workshop on Approximation, Randomization, and Combinatorial Optimization

The Fourier Entropy-Influence Conjecture for certain classes of Boolean functions

Ryan O'Donnell, John Wright, Yuan Zhou

ICALP 2011, Proceedings of the 38th International Colloquium on Automata, Languages and Programming

Hardness of Max-2Lin and Max-3Lin over integers, reals, and large cyclic groups

Ryan O'Donnell, Yi Wu, Yuan Zhou

CCC 2011, Proceedings of the 26th annual IEEE Conference on Computational Complexity

Finding almost-perfect graph bisections

Venkatesan Guruswami, Yury Makarychev, Prasad Raghavendra, David Steurer, Yuan Zhou

ITCS 2011, Proceedings of the 2nd Innovations in Theoretical Computer Science conference

Optimal lower bounds for locality sensitive hashing (except when q is tiny)

Ryan O'Donnell, Yi Wu, Yuan Zhou

ITCS 2011, Proceedings of the 2nd Innovations in Theoretical Computer Science conference

Tight Inapproximability Bounds for Almost-satisfiable Horn SAT and Exact Hitting Set

Venkatesan Guruswami, Yuan Zhou

SODA 2011, Proceedings of the 22th annual ACM-SIAM Symposium on Discrete Algorithms

Tighter Bounds for Facility Games

Pinyan Lu, Yajun Wang, Yuan Zhou

WINE 2009, Proceedings of the 5th International Workshop on Internet and Network Economics

On the α -Sensitivity of Nash Equilibria in PageRank-Based Network Reputation Games

Wei Chen, Shang-Hua Teng, Yajun Wang, Yuan Zhou

FAW 2009, Proceedings of the 3rd International Workshop on Frontiers in Algorithmics

Invited to *Theoretical Computer Science*

TALKS GIVEN

Computer Science Department, Indiana University at Bloomington, **Optimal Sparse Designs for Process Flexibility via Probabilistic Expanders**, 2016.10

Shanghai University of Finance and Economics, **Optimal Sparse Designs for Process Flexibility via Probabilistic Expanders**, 2016.07

ISMP 2015, **Optimal Sparse Designs for Process Flexibility via Probabilistic Expanders**, 2015.07

Computer Science Department, Indiana University at Bloomington, **Understanding the Power of Convex Relaxation Hierarchies: Effectiveness and Limitations**, 2014.03

Institute for Computational and Experimental Research in Mathematics, Brown University, **Hardness of Robust Graph Isomorphism, Lasserre Gaps, and Asymmetry of Random Graphs**, 2014.02

Computer Science Department, Dartmouth College, **Understanding the Power of Convex Relaxation Hierarchies: Effectiveness and Limitations**, 2014.02

ITCS 2014, **Approximation Schemes via Sherali-Adams Hierarchy for Dense Constraint Satisfaction Problems and Assignment Problems**, 2014.01

ITCS 2014, **Locally Testable Codes and Cayley Graphs**, 2014.01

SODA 2014, **Hypercontractive inequalities via SOS, and Frankl-Rödl graph**, 2014.01

Institute for Interdisciplinary Information Sciences, Tsinghua University, **Approximability and proof complexity**, 2014.01

Nanjing University, **Optimal PAC Multiple Arm Identification with Applications to Crowdsourcing**, 2013.12

Institute for Interdisciplinary Information Sciences, Tsinghua University, **Optimal PAC Multiple Arm Identification with Applications to Crowdsourcing**, 2013.12

Microsoft Research Asia, **Optimal PAC Multiple Arm Identification with Applications to Crowdsourcing**, 2013.12

Academy of Mathematics and Systems Science, Chinese Academy of Sciences, **Hardness of Robust Graph Isomorphism, Lasserre Gaps, and Asymmetry of Random Graphs**, 2013.12

Institute of Computing Technology, Chinese Academy of Sciences, **Hardness of Robust Graph Isomorphism, Lasserre Gaps, and Asymmetry of Random Graphs**, 2013.12

Microsoft Research Redmond, **Hardness of Robust Graph Isomorphism, Lasserre Gaps, and Asymmetry of Random Graphs**, 2013.11

The Chinese University of Hong Kong, **Approximability and proof complexity**, 2013.01

SODA 2013, **Approximability and proof complexity**, 2013.01

Purdue University Theory Seminar, **Approximating k -route cuts**, 2012.09

APPROX 2012, **Approximating bounded occurrence ordering CSPs**, 2012.08

The Microsoft Research–University of Washington Experience Theory Project, **Approximability and proof complexity**, 2012.08

Theory Seminar at IBM Almaden Research Center, **Approximability and proof complexity**, 2012.07

STOC 2012, **Hypercontractive norms, Sum-of-Squares Proofs, and their applications**, 2012.05

SODA 2012, **Polynomial integrality gaps for strong SDP relaxations of Densest k -Subgraph**, 2012.01

Theory Lunch at Carnegie Mellon University, **Approximating k -route cuts**, 2011.12

Microsoft Research Asia, **Approximating k -route cuts**, 2011.10

Institute of Computing Technology, Chinese Academy of Sciences, **Approximating k -route cuts**, 2011.10

Yangtze Microsoft Colloquium on Theoretical Computer Science, **Approximating k -route cuts**, 2011.10

China Theory Week 2011, **Approximating k -route cuts**, 2011.10

CCC 2011, **Hardness of Solving Sparse Linear Equations over Integers (and Large Cyclic Groups)**, 2011.06

Theory Lunch at Carnegie Mellon University, **Finding Almost-Perfect Graph Bisections**, 2011.04

SODA 2011, **Tight Bounds on the Approximability of Almost-satisfiable Horn SAT and Exact Hitting Set**, 2011.01

Yangtze Microsoft Colloquium on Theoretical Computer Science, **Optimal lower bounds for Locality Sensitive Hashing (except when q is tiny)**, 2011.01

ITCS 2011, **Optimal lower bounds for Locality Sensitive Hashing (except when q is tiny)**, 2011.01

ITCS 2011, **Finding Almost-Perfect Graph Bisections**, 2011.01

Theory Lunch at Carnegie Mellon University, **Tight Bounds on the Approximability of Almost-satisfiable Horn SAT**, 2010.12

Theory Seminar at University of Chicago, **Tight Bounds on the Approximability of Almost-satisfiable Horn SAT**, 2010.06

WINE 2009, **Tighter Bounds for Facility Games**, 2009.12

Theory Lunch at Carnegie Mellon University, **Tighter Bounds for Facility Games**, 2009.12

Microsoft Research Asia Theory Group Seminar, **The existence of α -sensitive Nash equilibria in PageRank games**, 2008.11

TEACHING

CSCI B503 Algorithm Design and Analysis IU-Bloomington, Spring 2017

CSCI B609 A Theorist's Toolkit IU-Bloomington, Fall 2016

18.434 Seminar in Theoretical Computer Science MIT, Spring 2016

6.006 Introduction to Algorithms MIT, Spring 2015

Guest lectures at Nanjing University Fall, 2011
Gave guest lectures on approximation algorithms and hardness of approximation in a course taught by Prof. Yitong Yin.

Lectures to Universities in Malaysia 2008.08
Gave lectures over the course of a week on elementary graph theory to students in three universities in Malaysia, including IIUM (International Islamic University, Malaysia), UiTM (University Technology Mara), UKM (University Kebangsaan Malaysia).

Coach and Science Committee Member of Chinese Olympiad in Informatics 2005, 2006, 2007
Gave lectures on algorithms and programming to high school students in National Training Team and National Team for IOI (International Olympiad in Informatics). Problem settler for Chinese NOI (National Olympiad in Informatics) in 2005, 2006, and 2007, and Chinese Team Selecting Contest in 2006.

SELECTED AWARDS
AND HONORS

Invited young researcher at the 1st Heidelberg Laureate Forum, 2013

Simons Graduate Fellowship in Theoretical Computer Science, 2012

Microsoft Research Fellowship finalist, 2011

Graduate fellowship by Carnegie Mellon University, 2009

Gordon Y.S. Wu Graduate Fellowship in Engineering by Princeton University, awarded for 4 years to a very select number of admitted Ph.D. students in Engineering School (declined), 2009

ACM International Collegiate Programming Contest, World Finals, KTH(Royal Institute of Technology, Sweden), 2nd Place, 2009

National Scholarship, 1st Prize. Offered by the Chinese Ministry of Education, Tsinghua University, 2007 and 2008

Tsinghua-Samsung Scholarship, 1st Prize, 2006

ACM International Collegiate Programming Contest, Asia Regional, Hangzhou site, 1st Place, 2005

International Olympiad in Informatics, Poland, Gold Medal (1st Place and full mark), 2005

PROFESSIONAL
SERVICES

Reviewer for the following conferences

- STOC, ACM Symposium on Theory of Computing
- FOCS, IEEE Symposium on Foundations of Computer Science
- CCC, IEEE Conference on Computational Complexity

- SODA, SIAM-ACM Symposium on Discrete Algorithms
- ICALP, International Colloquium on Automata, Languages, and Programming
- ITCS, Innovations in Theoretical Computer Science conference
- ESA, European Symposium on Algorithms
- APPROX/RANDOM, International Workshop on Approximation, Randomization, and Combinatorial Optimization
- FSTTCS, Conference on Foundations of Software Technology and Theoretical Computer Science
- STACS, International Symposium on Theoretical Aspects of Computer Science
- ISAAC, International Symposium on Algorithms and Computation
- FAW, International Workshop on Frontiers in Algorithmics
- CATS, Computing: the Australasian Theory Symposium

Reviewer for the following journals

- SIAM Journal on Computing
- Theory of Computing
- Algorithmica
- INFORMS Journal on Computing
- Theoretical Computer Science
- Management Science
- Operations Research Letters
- Journal of Computer Science and Technology

REFERENCES

Available upon request