

# Zeyu Guo

*Postdoctoral Researcher*

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## Education

- 2014.6–2017.6 **Doctor of Science**, *Computing and Mathematical Sciences Department, California Institute of Technology.*  
PhD thesis:  *$\mathcal{P}$ -schemes and Deterministic Polynomial Factoring over Finite Fields*  
Advisor: Chris Umans
- 2010.9–2014.6 **Master of Science**, *Computing and Mathematical Sciences Department, California Institute of Technology.*  
Master's thesis: *Randomness-Efficient Curve Sampling*  
Advisor: Chris Umans
- 2006.9–2010.6 **Bachelor of Science**, *School of Computer Science, Fudan University.*

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## Research Interests

Pseudorandomness, Algebraically Complexity Theory, Algebraic Methods in Theoretical Computer Science

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## Research Experience

- 2019.9–present **Postdoctoral Researcher**, *Department of Computer Science, University of Haifa.*  
Advisor: Noga Ron-Zewi
- 2017.9–2019.7 **Postdoctoral Researcher**, *Department of Computer Science and Engineering, Indian Institute of Technology Kanpur.*  
Advisor: Nitin Saxena
- 2010.9–2017.6 **Research Assistant**, *California Institute of Technology.*  
Advisor: Chris Umans
- 2013.8–2013.9 **Visiting student**, *Max Planck Institute for Computer Science.*
- 2012.8–2012.9 **Visiting student**, *Max Planck Institute for Computer Science.*
- 2008.9–2009.1 **Exchange Student**, *The University of Hong Kong.*  
Advisor: Francis Y. L. Chin
- 2007.3–2008.9 **Research Assistant**, *Fudan University.*  
Advisor: Hong Zhu

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## Teaching Experience

- 2014 Spring **Head Teaching Assistant**, *Introduction to Algorithms, Caltech CS38.*
- 2013 Spring **Teaching Assistant**, *Complexity Theory, Caltech CS151.*

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## Publications

- **Zeyu Guo**. Factoring Polynomials over Finite Fields with Linear Galois Groups: An Additive Combinatorics Approach. In *Proceedings of the 45th International Symposium on Mathematical Foundations of Computer Science (MFCS)*, pages 42:1–42:14, 2020.
- **Zeyu Guo** and Rohit Gurjar. Improved Explicit Hitting-Sets for ROABPs. In *Proceedings of the 24th International Workshop on Randomization and Computation (RANDOM)*, pages 4:1–4:16, 2020.
- **Zeyu Guo**. Deterministic Polynomial Factoring over Finite Fields: A Uniform Approach via  $\mathcal{P}$ -Schemes. *Journal of Symbolic Computation* 96: 22–67, 2020.
- **Zeyu Guo**, Mrinal Kumar, Ramprasad Satharishi and Noam Solomon. Derandomization from Algebraic Hardness: Treading the Borders. In *Proceedings of the 60th Annual IEEE Symposium on Foundations of Computer Science (FOCS)*, pages 147-157, 2019.
- **Zeyu Guo**, Nitin Saxena and Amit Sinhababu. Algebraic Dependencies and PSPACE Algorithms in Approximative Complexity. In *Proceedings of the 33rd Computational Complexity Conference (CCC)*, pages 10:1–10:21, 2018. Invited to the special issue of *Theory of Computing*.
- **Zeyu Guo**, Anand Kumar Narayanan and Chris Umans. Algebraic Problems Equivalent to Beating Exponent  $3/2$  for Polynomial Factorization over Finite Fields. In *Proceedings of the 41st International Symposium on Mathematical Foundations of Computer Science (MFCS)*, pages 47:1–47:14, 2016.
- **Zeyu Guo** and He Sun. Gossip vs. Markov Chains, and Randomness-Efficient Rumor Spreading. In *Proceedings of the 26th ACM-SIAM Symposium on Discrete Algorithms (SODA)*, pages 411–430, 2015.
- **Zeyu Guo**. Randomness-Efficient Curve Samplers, In *Proceedings of the 17th International Workshop on Randomization and Computation (RANDOM)*, pages 575–590, 2013.
- Francis Y. L. Chin, **Zeyu Guo** and He Sun. Minimum Manhattan Network is NP-Complete, In *Proceedings of the 25th Annual Symposium on Computational Geometry (SCG)*, pages 393–402, 2009. Journal version in *Discrete and Computational Geometry* 45(4): 701–722, 2011.
- **Zeyu Guo**, He Sun and Hong Zhu. Greedy Construction of 2-Approximation Minimum Manhattan Network, In *Proceedings of the 19th International Symposium on Algorithms and Computation (ISAAC)*, LNCS 5369, pages 4–15, 2008. Journal version in *International Journal of Computational Geometry and Applications* 21(3): 331–350, 2011.
- **Zeyu Guo**, He Sun and Hong Zhu. A Fast 2-Approximation Algorithm for the Minimum Manhattan Network Problem, In *Proceedings of the 4th International Conference on Algorithmic Aspects in Information and Management (AAIM)*, LNCS 5034, pages 212–223, 2008.

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## Presentations

- 2020.8 *The 45th International Symposium on Mathematical Foundations of Computer Science*, virtual conference.

- 2020.8 *The 24th International Workshop on Randomization and Computation*, virtual conference.
- 2019.3 *Workshop on Algebraic Complexity Theory*, Bengaluru, India.
- 2019.3 *Indian Institute of Technology Bombay*, Mumbai, India.
- 2019.1 *MPI-INF and MPI-MiS joint workshop on Theoretical Computer Science and Algebraic Geometry*, Saarbrücken, Germany.
- 2016.8 *The 41st International Symposium on Mathematical Foundations of Computer Science*, Krakow, Poland.
- 2015.7 *The 12th International Conference on Finite Fields and Their Applications*, Saratoga Springs, USA.
- 2015.1 *The 26th ACM-SIAM Symposium on Discrete Algorithms*, San Diego, USA.
- 2013.8 *China Theory Week*, Aarhus University, Denmark.
- 2012.8 Max Planck Institute for Informatics, Saarbrücken, Germany
- 2009.6 *The 25th Annual Symposium on Computational Geometry*, Aarhus University, Denmark.
- 2009.4 *The 2nd Annual Meeting of Asian Association for Algorithms and Computation*, Zhejiang University, China.
- 2008.6 *The 4th International Conference on Algorithmic Aspects in Information and Management*, Fudan University, China.
- 2008.4 *The 1st Annual Meeting of Asian Association for Algorithms and Computation*, The University of Hong Kong, China.

## Selected Honors

- 2013 **Invited to participate in China Theory Week.**  
Approximately 25-30 students are invited each year
- 2009 **President's Medal of Fudan University.**  
Awarded to only two undergraduates in 2009 as the highest honor of Fudan University
- 2009 **Wangdao Scholar.**  
Sponsored by Fudan Undergraduate Research Opportunities Program
- 2009 **National Scholarship.**  
Awarded to the top one student in the class for the overall performance
- 2008 **Chun-Tsung Scholar.**  
Sponsored by Chun-Tsung Undergraduate Research Endowment, which was established by Professor Tsung-Dao Lee
- 2005 **Bronze Medal**, National Olympiad in Informatics.

## Service to the community

- Referee for: SICOMP, Theory of Computing, COCOON 2013, STOC 2014, SODA 2018, FOCS 2019, COCOON 2019, ITCS 2020, STACS 2020, STOC 2020, CCC 2020, FOCS 2020, MFCS 2020

## Computer Skills

Programming	C/C++, Pascal, Java
OS	Windows, Linux
Typography	L <sup>A</sup> T <sub>E</sub> X
Mathematical software	SAGE, GAP, Mathematica, Matlab