

Ray Li

(Last Updated November 2021)

PERSONAL

WEBSITE: <https://cs.stanford.edu/~rayyli>
EMAIL: rayyli@cs.stanford.edu

EDUCATION

Expected 2022 PhD in COMPUTER SCIENCE, **Stanford University**, Stanford, CA
Advised by Jacob Fox and Mary Wootters
2017 M.S. in MATHEMATICAL SCIENCES, **Carnegie Mellon University**, Pittsburgh, PA
Thesis: *New developments in coding against insertions and deletions*
2017 B.S. in MATHEMATICAL SCIENCES, **Carnegie Mellon University**, Pittsburgh, PA

AWARDS AND HONORS

2017 - 2022 NSF Graduate Research Fellowship Program (NSF GRFP)
2013 - 2017 Knaster McWilliams Scholarship
2015 Putnam N1 (Top 16)
2013 International Math Olympiad (IMO) Silver Medal
2012, 2013 USA International Olympiad in Informatics (IOI) team candidate (Top 8)

TEACHING EXPERIENCE

2020 | Course Assistant at STANFORD UNIVERSITY
CS 254, Computational Complexity

2019 | Course Assistant at STANFORD UNIVERSITY
CS 265, Randomized Algorithms and Probabilistic Analysis

2018, 2019 | Instructor at IDEAMATH, Santa Clara, CA

2017, 2018 | Instructor at MATH OLYMPIAD SUMMER PROGRAM, Pittsburgh, PA
Some handouts available [here](#).

2015 | Teaching Assistant at CARNEGIE MELLON UNIVERSITY
21-127, Concepts of Mathematics

2012, 2014 | Instructor at IDEAMATH, Santa Clara, CA, Boston, MA, Pittsburgh, PA

2014 | Grader at MATH OLYMPIAD SUMMER PROGRAM, Pittsburgh, PA

OTHER WORK EXPERIENCE

MAY-JULY 2015 | Assistant Trading Intern at JANE STREET CAPITAL LLC, New York, NY

JAN 2014-MAR 2015 | CTO at EXP11 INC., Pittsburgh, PA

PROFESSIONAL SERVICE

- Stanford CS Undergraduate Mentoring
- Stanford Student Application Support Program (SASP)
- Stanford PhD Admissions Committee
- Stanford PhD Admitted Student buddy x2
- Stanford CURIS (Undergraduate Research) Mentor x2
- Stanford Undergraduate Research Competition Judge
- Stanford Undergraduate Research Association (SURA) Mentor
- Stanford Theory Retreat Organizer x2
- Stanford First Year Reading Group Organizer
- Subreviewer for STOC, FOCS, SODA, RANDOM, CPM, ISIT, ICALP, ESA, JACM, SICOMP, TALG, Electron. J. Comb., IEEE Trans. Info. Th., IEEE Trans. Mol. Biol. Multi-Scale Commun., Fibonacci Quart., J. Number Theory
- Math Olympiad Problem Setter (USA Junior Math Olympiad 2018, USA IMO Team Selection, 2017, 2018)

CONFERENCE PUBLICATIONS

- C1 X. He, V. Guruswami, and R. Li, The zero rate threshold for adversarial bit deletions is less than $1/2$, *Proceedings of the 62nd IEEE Annual Symposium on Foundations of Computer Science (FOCS)*, to appear, 2021.
- C2 M. Dalirrooyfard, R. Li, and V. Vassilevska Williams, Hardness of Approximate Diameter: Now for Undirected Graphs, *Proceedings of the 62nd IEEE Annual Symposium on Foundations of Computer Science (FOCS)*, to appear, 2021.
- C3 Z. Guo, R. Li, C. Shangguan, I. Tamo, and M. Wootters, Improved List-Decodability of Reed–Solomon Codes via Tree Packings, *Proceedings of the 62nd IEEE Annual Symposium on Foundations of Computer Science (FOCS)*, to appear, 2021.
- C4 J. Hastings, A. Kanne, R. Li, and M. Wootters, Wedge-Lifted codes, *Proceedings of the 2021 IEEE International Symposium on Information Theory (ISIT)*, 2990–2995, 2021.
- C5 R. Li, Settling SETH vs. Approximate Sparse Directed Unweighted Diameter (up to (NU)NSETH), *Proceedings of the 53rd Annual ACM Symposium on Theory of Computing (STOC)*, 1684–1696, 2021.
- C6 V. Guruswami, R. Li, M. Mosheiff, N. Resch, S. Silas, and M. Wootters, Bounds for list-decoding and list-recovery of random linear codes, *Proceedings of the 24th International Conference on Randomization and Computation (RANDOM)*, 9:1–9:21, 2020.
- C7 J. Brakensiek, R. Li, and B. Spang, Coded trace reconstruction in a constant number of traces, *Proceedings of the 61st IEEE Annual Symposium on Foundations of Computer Science (FOCS)*, 482–493, 2020.
- C8 R. Li, P. Liang, and S. Mussmann, A tight analysis of greedy yields subexponential time approximation for uniform decision tree, *Proceedings of the 30th Annual ACM-SIAM Symposium on Discrete Algorithms (SODA)*, 102–121, 2020.
- C9 C. Carlson, A. Kolla, R. Li, N. Mani, B. Sudakov, and L. Trevisan, Lower bounds for max-cut in H-free graphs via semidefinite programming, *Proceedings of the 14th Latin American Symposium on Theoretical Informatics (LATIN)*, 479–490, 2020.

- C10 R. Li and M. Wootters, Lifted multiplicity codes and the disjoint repair group property, *Proceedings of the 23rd International Conference on Randomization and Computation (RANDOM)*, 38:1–38:18, 2019.
- C11 R. Li and M. Wootters, Improved list-decodability of random linear binary codes, *Proceedings of the 22nd International Conference on Randomization and Computation (RANDOM)* **67**, 50:1–50:19, 2018.
- C12 V. Guruswami and R. Li, Coding against deletions in oblivious and online models, *Proceedings of the 28th Annual ACM-SIAM Symposium on Discrete Algorithms (SODA)*, 625–643, 2018.
- C13 V. Guruswami and R. Li, Efficiently decodable codes for the binary deletion channel, *Proceedings of the 21st International Workshop on Randomization and Computation (RANDOM)*, 47:1–47:13, 2017.
- C14 V. Guruswami and R. Li, Efficiently decodable insertion/deletion codes for high-noise and high-rate regimes, *Proceedings of the 2016 IEEE International Symposium on Information Theory (ISIT)*, 620–624, 2016.

JOURNAL PUBLICATIONS

- J1 C. Carlson, A. Kolla, R. Li, N. Mani, B. Sudakov, and L. Trevisan, Lower bounds for max-cut in H-free graphs via semidefinite programming, *SIAM Journal on Discrete Mathematics* **35**, 1557–1568, 2021.
- J2 R. Li and M. Wootters, Lifted multiplicity codes and the disjoint repair group property, *IEEE Transactions on Information Theory* **67**, 716–725, 2021.
- J3 R. Li and M. Wootters, Improved list-decodability of random linear binary codes, *IEEE Transactions on Information Theory* **67**, 1522–1536, 2021.
- J4 X. He and R. Li, Hat guessing numbers of degenerate graphs, *Electronic Journal of Combinatorics* **27**, 2020.
- J5 J. Fox and R. Li, On edge-ordered Ramsey numbers, *Random Structures and Algorithms* **57**, 1174–1204, 2020.
- J6 V. Guruswami and R. Li, Coding against deletions in oblivious and online models, *IEEE Transactions on Information Theory* **66**, 2352–2374, 2020.
- J7 J. Fox and R. Li, On Ramsey numbers of hedgehogs, *Combinatorics, Probability, and Computing* **29**, 101–112, 2019.
- J8 V. Guruswami and R. Li, Polynomial time decodable codes for the binary deletion channel, *IEEE Transactions on Information Theory* **65**, 2171–2178, 2019.
- J9 R. Li and S. J. Miller, Central limit theorems for gaps of Generalized Zeckendorf Decompositions, *Fibonacci Quarterly* **57**, 213–230, 2019.

TALKS

- T1 The zero-rate threshold of adversarial bit-deletions is less than $1/2$, University of Washington Theory Seminar, October 2021.
- T2 Approximating Graph Diameter: Algorithms, Hardness, and Hardness of Hardness, USC Theory Lunch, October 2021.
- T3 Approximating Graph Diameter: Algorithms, Hardness, and Hardness of Hardness, UCSD Theory Seminar, October 2021.

- T4 The zero-rate threshold of adversarial bit-deletions is less than $1/2$., Michigan-Purdue Theory Seminar, September 2021.
- T5 What is... an error correcting code, What is... a seminar?, September 2021.
- T6 Settling SETH vs. Approximate Sparse Directed Unweighted Diameter (up to $(\text{NU})^{\text{NSETH}}$), STOC, June 2021.
- T7 Settling SETH vs. Approximate Sparse Directed Unweighted Diameter (up to $(\text{NU})^{\text{NSETH}}$), Sydney Algorithms and Computing Theory Seminar, May 2021.
- T8 Improve list-decoding of Reed Solomon codes via tree-packings, University of Delaware, Discrete Mathematics/Algebra Seminar, February 2021.
- T9 Improve list-decoding of Reed Solomon codes via tree-packings, UChicago/TTIC Coding Theory reading group, January 2021.
- T10 Coded trace reconstruction in a constant number of traces, FOCS, November 2020.
- T11 Settling SETH vs. Approximate Sparse Directed Unweighted Diameter (up to $(\text{NU})^{\text{NSETH}}$), Stanford Theory Lunch, November 2020.
- T12 Fine grained hardness of approximation, Stanford Computer Science Theory Qualifying Exam, March 2020.
- T13 Coded trace reconstruction in a constant number of traces, Stanford theory lunch, January 2020.
- T14 A tight analysis of greedy yield subexponential time approximation on uniform decision tree, Symposium on Discrete Algorithms (SODA), January 2020.
- T15 Coded trace reconstruction in a constant number of traces, TOCA-SV, November 2019.
- T16 Lifted multiplicity codes and the disjoint repair group property, Stanford theory lunch, August 2019.
- T17 Edge-ordered Ramsey numbers, Random structures and algorithms, Zurich, July 2019.
- T18 Edge-ordered Ramsey numbers, Stanford combinatorics seminar, April 2019.
- T19 Beating a $O(\log n)$ approximation on an active learning problem, Stanford theory lunch, January 2019.
- T20 Improved list decodability of random linear binary codes, RANDOM, Princeton, August 2018.
- T21 Randomness in math and computer science, Math Olympiad Summer Program (MOP), June 2018.
- T22 Random linear binary codes have smaller list sizes than uniformly random binary codes, CMU theory lunch, March 2018.
- T23 Random linear binary codes have smaller list sizes than uniformly random binary codes, Stanford theory lunch, March 2018.
- T24 Coding against deletions in oblivious and online models, Symposium on Discrete Algorithms (SODA), New Orleans, January 2018.
- T25 Efficiently decodable codes for the binary deletion channel, RANDOM, Berkeley, August 2017.
- T26 A collection of central limit type results in Generalized Zeckendorf Decompositions, Young Mathematicians Conference (YMC), Columbus, August 2016.
- T27 Efficiently decodable insertion/deletion codes for high-noise and high-rate regimes, International Symposium on Information Theory (ISIT), Barcelona, July 2016.

T28 Convergence rates in generalized Zeckendorf decomposition problems, Workshop on Combinatorial and Additive Number Theory (CANT), May 2016.