PRAHLADH HARSHA

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Education

2004 **Massachusetts Institute of Technology (MIT)** ..... Cambridge, MA, USA

Doctor of Philosophy (PhD) in Computer Science
Thesis Title: *Robust PCPs of Proximity and Shorter PCPs*
Advisor: Prof. Madhu Sudan

2000 **Massachusetts Institute of Technology (MIT)** ..... Cambridge, MA, USA

Master of Science (SM) in Computer Science
Thesis Title: *Small PCPs with low query complexity*
Advisor: Prof. Madhu Sudan

1998 **Indian Institute of Technology (IIT), Madras** ..... Chennai, INDIA

Bachelor of Technology (BTech) in Computer Science and Engineering

Employment

Dec'09 – present **Tata Institute of Fundamental Research (TIFR)** ..... Mumbai, INDIA
School of Technology and Computer Science
Reader [Dec'09–Dec'14], Associate Professor [Jan'15–Jun'21], Professor [Jul'21–current]

Sep'08 – Oct'09 **University of Texas at Austin** ..... Austin, TX, USA
Research Fellow, Dept. Computer Science

Sep'04 – Aug'08 **Toyota Technological Institute (TTI), Chicago** ..... Chicago, IL, USA
Research Assistant Professor

Jan'05 – Sep'05 **Microsoft Research, Silicon Valley** ..... Mountain View, CA, USA
Postdoctoral Researcher
(while on leave from Toyota Technological Institute, Chicago)

Visiting Positions

Simons Institute for the Theory of Computing ..... Berkeley, CA, USA

Visiting Scientist (Mar–May '24, Oct '21 – Mar '22, Jul–Dec '19, Aug–Dec '13)

Feb'17 – Jul'17 **Weizmann Institute of Science** ..... Rehovot, ISRAEL
Visiting Associate Professor, Department of Applied Mathematics and Computer Science
(while on sabbatical from TIFR)

Sep'16 – Jan'17 **Rutgers University** ..... New Brunswick, NJ, USA
Murray Visiting Professor, DIMACS and Dept. Computer Science
(while on sabbatical from TIFR)

Jul'10 – Jul'13 **Institute of Mathematical Sciences (IMSc)** ..... Chennai, INDIA
Visiting Faculty

Nov'08 – Jun'09 **Technion, Israel Institute of Technology** ..... Haifa, ISRAEL
Aly Kaufman Visiting Scientist

Honours and Awards

Fellow of the Indian Academy of Sciences

Google India Research Award 2022.

Swarnajayanti Fellowship Award 2015-16 in Mathematical Sciences (Department of Science and Technology, Government of India)

NASI-SCOPUS Young Scientist Award 2011 for Mathematics

Associate of the Indian Academy of Sciences (for the period: 2011–2014)

Students advised

PhD Students

- Girish Varma (Thesis: Hardness of Approximate Coloring, TIFR, 2016)
- Swagato Sanyal (Thesis: Complexity Measures of Boolean Functions: Fourier Sparsity, Fourier Dimension and Query Complexity, TIFR, 2017)
  ACM India 2018 Doctoral Dissertation Award, Honorable Mention
- Rakesh Venkat (Thesis: On Sparsest Cut and Parallel Repetition, TIFR, 2017)
- Siddharth Bhandari (Thesis: Exact Sampling and List-Decoding, TIFR, 2021)
  ACM India 2022 Doctoral Dissertation Award
- Tulasimohan Molli (Thesis: On Complexity Measures of Boolean Functions, TIFR 2023)
- Arghya Chakraborty (current)
- Ashutosh Shankar (current)
- Ratnakar Medepalli (current, co-advised with Akshayaram Srinivasan)

Undergraduate

- Sivakanth Gopi, IIT Bombay (supervised jointly with Prof. Srikanth Srinivasan, IIT Bombay)

Summer Interns

- Amey Bhangale (Rutgers University), Abhishek Brushundi (Rutgers University), Akshay Kamath (Chennai Mathematical Institute), Arpit Merchant (IIIT Hyderabad), Sasank Mouli (IIT Kanpur), Vishvajeet Nagargoje (IIT Madras), Aditya Pottukuchi (Rutgers University), Rohan Goyal (Chennai Mathematical Institute), Harsh Sharma (Chennai Mathematical Institute)

Funding

Israel-India ISF-UGC grant on "Two player games: hardness of approximation and communication" (joint project with Prof. Irit Dinur, Weizmann Institute for 3 years)

Indo-US Joint Center for Research on Pseudorandomness in Computer Science (joint project led by Prof. Arnab Bhattacharyya (IISc, Bangalore) and Prof. Shachar Lovett (Univ. California, San Diego) for 2 years, co-PI's include Prof. Chandan Saha (IISc Bangalore), Prof. Srikanth Srinivasan (IIT Bombay), Prof. Raghu Meka (Univ. California, Los Angeles), Prof. Luca Trevisan (Univ. California, Berkeley) and Prof. Madhur Tulsiani (TTI Chicago)).

Swarnajayanti Fellowship Grant for "Locally Testable Codes: Constructions and Limitations" (5 year project, 2017–2022).

Google India Research Award 2022 for "Super-efficient verification in the age of the blockchain".

Professional Activities

Editorial Work

Editor-in-Chief, ACM Transactions on Computation Theory (2023 – Present)
Member of Editorial Board, Electronic Colloquium on Computational Complexity (ECCC)

(2021 – present)
Member of Editorial Board, Indian Journal of Discrete Mathematics (2019 – present)
Coordinating Editor, Algorithmica (2018 – 2023)
Associate Editor, SIAM Journal on Computing (2017 – 2022)
Editor for Proc. 35th FSTTCS 2015, vol 45 of LIPIcs, Schloss Dagstuhl.
Guest Editor for the CCC 2016 Special Issue in Theory of Computing (ToC) journal.

Chair of Program Committee:

FSTTCS 2015 (co-chair)

Member of Program Committee:

RANDOM 2009, APPROX 2011, FSTTCS 2011, RANDOM 2013, FSTTCS 2013, CALDAM 2015, FSTTCS 2015, CCC 2016, FOCS 2016, FSTTCS 2018, STOC 2020, CCC 2020, RANDOM 2020, ICALP 2021, CSR 2022, RANDOM 2023, ITCS 2025, STOC 2025.

Programs/Workshops Organized:

Organizer (with Irit Dinur, Avishay Tal, Salil Vadhan and David Zuckerman) for the Simons Program on *Pseudorandomness and High-dimensional Expansion*, Simons Institute for Theory of Computing, Berkeley, 24 August – 18 December, 2026.
Organizer (with Venkatesan Guruswami and Irit Dinur) for *ICTS Workshop on High-dimensional Expanders and Codes*, International Centre for Theoretical Sciences (ICTS), 28 April – 7 May, 2025.
Organizer (with Parikshit Gopalan, Venkatesan Guruswami, Rahul Jain and K V Subrahmanyam) of *ICTS Workshop on Combinatorics, complexity and information: It is entropy that counts*, International Centre for Theoretical Sciences (ICTS), 8–9 May, 2025.
Convenor (with Shibashis Guha) of the *STCS Vigyan Vidushi 2022* programme, TIFR, 2–15 July, 2022.
Organizer (with Irit Dinur) for the Simons Summer Cluster on *High Dimensional Expanders and Error-Correcting Codes*, Simons Institute for Theory of Computing, Berkeley, 11 July – 9 August, 2019.
Organizer (with Ramprasad Saptharishi and Srikanth Srinivasan) for *ICTS Workshop on Algebraic Complexity Theory (WACT)*, International Centre for Theoretical Sciences (ICTS), 25– 29 March, 2019.
Organizer (with Vinod Prabhakaran and Jaikumar Radhakrishnan) for the workshop *Bombay Information Theory Seminar (BITS)*, in commemoration of the birth centenary of Claude E. Shannon, IIT Bombay/ TIFR, January 2016.
Organizer (with Arkadev Chattopadhyay and Jaikumar Radhakrishnan) for the workshop on *Recent Progress in Arithmetic Complexity*, TIFR, February 2014.
Organizer (with Amit Deshpande and Saket Saurabh) for the *4th Annual Mysore Park Workshop in Theoretical Computer Science: Algorithms and Complexity*, August 2013.
Organizer (with Amit Deshpande and Saket Saurabh) for the *3rd Annual Mysore Park Workshop in Theoretical Computer Science: Algorithms and Complexity*, August 2012.
Organizer (with Amit Deshpande and Saket Saurabh) for the *2nd Annual Mysore Park Workshop in Theoretical Computer Science: Algorithms and Complexity*, May 2011.
Organizer (with Moses Charikar) for the DIMACS Tutorial, *Limits of Approximation Algorithms: PCPs and Unique games*, June 2009.

Publications

Journals

[J1] Siddharth Bhandari, Prahladh Harsha, Mrinal Kumar, and Ashutosh Shankar. Algorithmizing the Multiplicity Schwartz-Zippel lemma. *TheoretiCS*. (To appear, Preliminary version in *34th SODA*, 2023).

[J2] Nir Bitansky, Prahladh Harsha, Yuval Ishai, Ron D. Rothblum, and David J. Wu. Dot-product proofs and their applications. *SIAM Journal of Computing*. (To appear, Prelimi-

nary version in *65th FOCS*, 2024).

[J3] Irit Dinur, Yuval Filmus, and Prahladh Harsha. Agreement tests on graphs and hypergraphs. *SIAM Journal of Computing*, 54(2):279–320, 2025. (Preliminary version in *30th SODA*, 2019).

[J4] Prahladh Harsha and Ramprasad Saptharishi. On the elementary construction of high-dimensional expanders of Kaufman and Oppenheim. *Theory of Computing*, 20(5):1–22, 2024.

[J5] Irit Dinur, Yuval Filmus, and Prahladh Harsha. Sparse juntas on the biased hypercube. *TheoretiCS*, 3(18):1–44, 2024. (Preliminary version in *30th SODA*, 2019).

[J6] Yotam Dikstein, Irit Dinur, Yuval Filmus, and Prahladh Harsha. Boolean function analysis on high-dimensional expanders. *Combinatorica*, 44:563–620, 2024. (Preliminary version in *22nd RANDOM*, 2018).

[J7] Amey Bhangale, Prahladh Harsha, Orr Paradise, and Avishay Tal. Rigid matrices from rectangular PCPs or Hard Claims have Complex Proofs. *SIAM Journal of Computing*, 53(2):480–523, 2024. (Preliminary version in *61st FOCS*,2020).

[J8] Siddharth Bhandari, Prahladh Harsha, Mrinal Kumar, and Madhu Sudan. Ideal-theoretic explanation of capacity-achieving decoding. *IEEE Transactions on Information Theory*, 70(2):1107–1123, 2024. (Preliminary version in *25th RANDOM*, 2021).

[J9] Siddharth Bhandari, Prahladh Harsha, Mrinal Kumar, and Madhu Sudan. Decoding multivariate multiplicity codes over product sets. *IEEE Transactions on Information Theory*, 70(1):154–169, 2024. (Preliminary version in *53rd STOC*, 2021).

[J10] Irit Dinur, Prahladh Harsha, Tali Kaufman, and Noga Ron-Zewi. From local testing to robust testing via agreement testing. *Theory of Computing*, 18(12):1–25, 2022. (Preliminary version in *10th ITCS*, 2019).

[J11] Irit Dinur, Prahladh Harsha, Tali Kaufman, Inbal Livni Navon, and Amnon TaShma. List decoding with double samplers. *SIAM Journal of Computing*, 50(2):301–349, 2021. (Preliminary version in *30th SODA*, 2019).

[J12] Siddharth Bhandari, Prahladh Harsha, Tulasimohan Molli, and Srikanth Srinivasan. On the probabilistic degree of OR over the Reals. *Random Structures and Algorithms*, 59(1):53–67, 2021. (Preliminary version in *38th FSTTCS*, 2018).

[J13] Amey Bhangale, Prahladh Harsha, and Girish Varma. A characterization of hard-to-cover CSPs. *Theory of Computing*, 16(16):1–29, 2020. (Preliminary version in 30*th Computational Complexity Conference*, 2015).

[J14] Shubhada Agrawal, Siddharth Bhandari, Anirban Bhattacharjee, Anand Deo, Narendra M. Dixit, Prahladh Harsha, Sandeep Juneja, Poonam Kesarwani, Aditya Krishna Swamy, Preetam Patil, Nihesh Rathod, Ramprasad Saptharishi, Sharad Sriram, Piyush Srivastava, Rajesh Sundaresan, Nidhin Koshy Vaidhiyan, and Sarath Yasodharan. City-scale agent-based simulators for the study of non-pharmaceutical interventions in the context of the COVID-19 epidemic. *Journal of the Indian Institute of Science*, 100:809–847, 2020.

[J15] Prahladh Harsha and Srikanth Srinivasan. On polynomial approximations to AC^0. *Random Structures and Algorithms*, 54(2):289–303, 2019. (Preliminary version in *20th RANDOM*, 2016).

[J16] Prahladh Harsha and Srikanth Srinivasan. Robust multiplication-based tests for Reed-Muller codes. *IEEE Transactions on Information Theory*, 65(1):184–197, 2019. (Preliminary version in *36th FSTTCS*, 2016).

[J17] Venkat Guruswami, Prahladh Harsha, Johan Hstad, Srikanth Srinivasan, and Girish Varma. Super-polylogarithmic hypergraph coloring hardness via low-degree long codes.

SIAM Journal of Computing, 46(1):132–159, 2017. (Preliminary version in *46th STOC*, 2014).

[J18] Prahladh Harsha, Adam Klivans, and Raghu Meka. Bounding the sensitivity of polynomial threshold functions. *Theory of Computing*, 10(1):1–24, 2014. (special Issue on Analysis of Boolean Functions; Preliminary version in *42nd STOC*, 2010).

[J19] Irit Dinur and Prahladh Harsha. Composition of low-error 2-query PCPs using decodable PCPs. *SIAM Journal of Computing*, 42(6):2452–2486, 2013. (special issue for FOCS 2009; Preliminary version in *51st FOCS*, 2009).

[J20] Prahladh Harsha, Adam Klivans, and Raghu Meka. An invariance principle for polytopes. *Journal of the ACM*, 59(6):29, 2012. (Preliminary version in *42nd STOC*, 2010).

[J21] Eli Ben-Sasson and Prahladh Harsha. Lower bounds for bounded depth Frege proofs via Buss-Pudlák games. *ACM Transactions on Computational Logic*, 11(3):1–17, 2010.

[J22] Prahladh Harsha, Rahul Jain, David McAllester, and Jaikumar Radhakrishnan. The communication complexity of correlation. *IEEE Transactions on Information Theory*, 56(1):438–449, 2010. (Preliminary version in *22nd IEEE Conference on Computational Complexity*, 2007).

[J23] Eli Ben-Sasson, Prahladh Harsha, Oded Lachish, and Arie Matsliah. Sound 2-query PCPPs are long. *ACM Transactions on Computation Theory*, 1(2):1–49, 2009. (Preliminary version in *35th ICALP*, 2008).

[J24] Prahladh Harsha, Yuval Ishai, Joe Kilian, Kobbi Nissim, and Srinivas Venkatesh. Communication vs. computation. *Computational Complexity*, 16(1):1–33, 2007. (Preliminary version in *31st ICALP*, 2004).

[J25] Eli Ben-Sasson, Oded Goldreich, Prahladh Harsha, Madhu Sudan, and Salil Vadhan. Robust PCPs of proximity, shorter PCPs and applications to coding. *SIAM Journal of Computing*, 36(4):889–974, 2006. (special issue on Randomness and Computation; Preliminary version in *36th STOC*, 2004).

[J26] Eli Ben-Sasson, Prahladh Harsha, and Sofya Raskhodnikova. Some 3CNF properties are hard to test. *SIAM Journal of Computing*, 35(1):1–21, 2005. (Preliminary version in *35th STOC*, 2003).

[J27] Prahladh Harsha and Madhu Sudan. Small PCPs with low query complexity. *Computational Complexity*, 9(3–4):157–201, December 2000. (Preliminary version in *18th STACS*, 2001).

[J28] Kamala Krithivasan, Sakthi Balan, and Prahladh Harsha. Distributed processing in automata. *International Journal of Foundations of Computer Science*, 10(4):443–463, December 1999.

Refereed Conference Publications

[C1] Amey Bhangale, Arghya Chakraborty, and Prahladh Harsha. Optimal online bipartite matching in degree-2 graphs. In Ho-Lin Chen, Wing-Kai Hon, and Meng-Tsung Tsai, editors, *Proc. 36th International Symposium on Algorithms and Computation (ISAAC)*, volume 359 of *Leibniz International Proceedings in Informatics*, pages 13:1–13:19. Schloss Dagstuhl, 2025.

[C2] Rohan Goyal, Prahladh Harsha, Mrinal Kumar, and Ashutosh Shankar. Fast list-decoding of univariate multiplicity and folded Reed-Solomon codes. In Santosh Vempala, editor, *Proceedings of the 65th IEEE Symposium on Foundations of Computer Science (FOCS)*, pages 328–343, 2024.

[C3] Prahladh Harsha, Mrinal Kumar, Ramprasad Saptharishi, and Madhu Sudan. An improved line-point low-degree test. In Santosh Vempala, editor, *Proceedings of the 65th IEEE Symposium on Foundations of Computer Science (FOCS)*, pages 1883–1892, 2024.

[C4] Nir Bitansky, Prahladh Harsha, Yuval Ishai, Ron D. Rothblum, and David J. Wu. Dot-product proofs and their applications. In Santosh Vempala, editor, *Proceedings of the* 65*th IEEE Symposium on Foundations of Computer Science (FOCS)*, pages 806–825, 2024.

[C5] Sumanta Ghosh, Prahladh Harsha, Simao Herdade, Mrinal Kumar, and Ramprasad Saptharishi. Fast numerical multivariate multipoint evaluation. In Amit Sahai, Shubhangi Saraf, and Thomas Vidick, editors, *Proceedings of the* 64*th IEEE Symposium on Foundations of Computer Science (FOCS)*, pages 1426–1439, 2023.

[C6] Prahladh Harsha, Tulasimohan Molli, and Ashutosh Shankar. Criticality of AC^0-formulae. In Amnon TaShma, editor, *Proceedings of the* 38*th Computational Complexity Conference*, volume 264 of *Leibniz International Proceedings in Informatics*, pages 19:1–19:24. Schloss Dagstuhl, 2023.

[C7] Siddharth Bhandari, Prahladh Harsha, Mrinal Kumar, and Ashutosh Shankar. Algorithmizing the Multiplicity Schwartz-Zippel lemma. In Nikhil Bansal and Viswanath Nagarajan, editors, *Proceedings of the* 34*th Annual ACM-SIAM Symposium on Discrete Algorithms (SODA)*, pages 2816–2835, 2023.

[C8] Prahladh Harsha, Daniel Mitropolsky, and Alon Rosen. Downward self-reducibility in TFNP. In Yael Kalai, editor, *Proceedings of the* 14*th Innovations in Theoretical Computer Science (ITCS)*, volume 251 of *Leibniz International Proceedings in Informatics*, pages 67:1–67:17. Schloss Dagstuhl, 2023.

[C9] Siddharth Bhandari, Prahladh Harsha, Ramprasad Saptharishi, and Srikanth Srinivasan. Vanishing spaces of random sets and applications to Reed-Muller codes. In Shachar Lovett, editor, *Proceedings of the* 37*th Computational Complexity Conference*, volume 234 of *Leibniz International Proceedings in Informatics*, pages 32:1–32:14. Schloss Dagstuhl, 2022.

[C10] Amey Bhangale, Prahladh Harsha, and Sourya Roy. Mixing of 3-term progressions in quasirandom groups. In Mark Braverman, editor, *Proceedings of the* 13*th Innovations in Theoretical Computer Science (ITCS)*, volume 215 of *Leibniz International Proceedings in Informatics*, pages 20:1–20:9. Schloss Dagstuhl, 2022.

[C11] Siddharth Bhandari, Prahladh Harsha, Mrinal Kumar, and Madhu Sudan. Ideal-theoretic explanation of capacity-achieving decoding. In Mary Wootters and Laura Sanità, editors, *Proceedings of the* 25*th International Conference on Randomization and Computation (RANDOM)*, volume 207 of *Leibniz International Proceedings in Informatics*, pages 56:1–56:21. Schloss Dagstuhl, 2021.

[C12] Siddharth Bhandari, Prahladh Harsha, Mrinal Kumar, and Madhu Sudan. Decoding multivariate multiplicity codes over product sets. In Samir Khuller and Virginia Vassilevska Williams, editors, *Proceedings of the* 53*rd ACM Symposium on Theory of Computing (STOC)*, pages 1489–1501, 2021.

[C13] Irit Dinur, Yuval Filmus, Prahladh Harsha, and Madhur Tulsiani. Explicit SoS lower bounds from high-dimensional expanders. In James R. Lee, editor, *Proceedings of the* 12*th Innovations in Theoretical Computer Science (ITCS)*, volume 185 of *Leibniz International Proceedings in Informatics*, pages 40:1–40:16. Schloss Dagstuhl, 2021.

[C14] Amey Bhangale, Prahladh Harsha, Orr Paradise, and Avishay Tal. Rigid matrices from rectangular PCPs or Hard Claims have Complex Proofs. In Sandy Irani, editor, *Proceedings of the* 61*st IEEE Symposium on Foundations of Computer Science (FOCS)*, pages 858–869, 2020.

[C15] Abhishek Bhrushundi, Prahladh Harsha, Pooya Hatami, Swastik Kopparty, and Mrinal Kumar. On multilinear forms: Bias, correlation, and tensor rank. In Jarosław Byrka and Raghu Meka, editors, *Proceedings of the* 24*th International Conference on Randomiza-*

tion and Computation (RANDOM), volume 176 of *Leibniz International Proceedings in Informatics*, pages 29:1–29:23. Schloss Dagstuhl, 2020.

[C16] Prahladh Harsha, Subhash Khot, Euiwoong Lee, and Devanathan Thiruvenkatachari. Improved hardness for 3LIN via linear label cover. In Dimitris Achlioptas and László A. Vêgh, editors, *Proceedings of the 22nd International Conference on Approximation Algorithms for Combinatorial Optimization Problems (APPROX)*, volume 137 of *Leibniz International Proceedings in Informatics*, pages 9:1–9:16. Schloss Dagstuhl, 2019.

[C17] Irit Dinur, Prahladh Harsha, Tali Kaufman, and Noga Ron-Zewi. From local testing to robust testing via agreement testing. In Avrim Blum, editor, *Proceedings of the 10th Innovations in Theoretical Computer Science (ITCS)*, volume 124 of *Leibniz International Proceedings in Informatics*, pages 29:1–29:18. Schloss Dagstuhl, 2019.

[C18] Irit Dinur, Yuval Filmus, and Prahladh Harsha. Analyzing Boolean functions on the biased hypercube via higher-dimensional agreement tests. In Timothy M. Chan, editor, *Proceedings of the 30th Annual ACM-SIAM Symposium on Discrete Algorithms (SODA)*, pages 2124–2133, 2019.

[C19] Irit Dinur, Prahladh Harsha, Tali Kaufman, Inbal Livni Navon, and Amnon TaShma. List decoding with double samplers. In Timothy M. Chan, editor, *Proceedings of the 30th Annual ACM-SIAM Symposium on Discrete Algorithms (SODA)*, pages 2134–2153, 2019.

[C20] Siddharth Bhandari, Prahladh Harsha, Tulasimohan Molli, and Srikanth Srinivasan. On the probabilistic degree of OR over the Reals. In Sumit Ganguly and Paritosh Pandya, editors, *Proceedings of the 38th IARCS Annual Conference on Foundations of Software Technology and Theoretical Computer Science (FSTTCS)*, volume 122 of *Leibniz International Proceedings in Informatics*, pages 5:1–5:12. Schloss Dagstuhl, 2018.

[C21] Yotam Dikstein, Irit Dinur, Yuval Filmus, and Prahladh Harsha. Boolean function analysis on high-dimensional expanders. In Eric Blais, Klaus Jansen, José D. P. Rolim, and David Steurer, editors, *Proceedings of the 22nd International Conference on Randomization and Computation (RANDOM)*, volume 116 of *Leibniz International Proceedings in Informatics*, pages 38:1–38:20. Schloss Dagstuhl, 2018.

[C22] Abhishek Bhrushundi, Prahladh Harsha, and Srikanth Srinivasan. On polynomial approximations over $\mathbb{Z}/2^k\mathbb{Z}$. In Heribert Vollmer and Brigitte Vallée, editors, *Proceedings of the 34th Symposium on Theoretical Aspects of Computer Science (STACS)*, volume 66 of *Leibniz International Proceedings in Informatics*, pages 12:1–12:12. Schloss Dagstuhl, 2017.

[C23] Irit Dinur, Prahladh Harsha, Rakesh Venkat, and Henry Yuen. Multiplayer parallel repetition for expander games. In Christos Papadimitriou, editor, *Proceedings of the 8th Innovations in Theoretical Computer Science (ITCS)*, volume 67 of *Leibniz International Proceedings in Informatics*, pages 37:1–37:16. Schloss Dagstuhl, 2017. (Invited paper).

[C24] Amit Deshpande, Prahladh Harsha, and Rakesh Venkat. Embedding approximately low-dimensional ℓ_2^2 metrics into ℓ_1. In Akash Lal, S. Akshay, Saket Saurabh, and Sandeep Sen, editors, *Proceedings of the 36th IARCS Annual Conference on Foundations of Software Technology and Theoretical Computer Science (FSTTCS)*, volume 65 of *Leibniz International Proceedings in Informatics*, pages 10:1–10:13. Schloss Dagstuhl, 2016.

[C25] Prahladh Harsha and Srikanth Srinivasan. Robust multiplication-based tests for Reed-Muller codes. In Akash Lal, S. Akshay, Saket Saurabh, and Sandeep Sen, editors, *Proceedings of the 36th IARCS Annual Conference on Foundations of Software Technology and Theoretical Computer Science (FSTTCS)*, volume 65 of *Leibniz International Proceedings in Informatics*, pages 17:1–17:14. Schloss Dagstuhl, 2016.

[C26] Prahladh Harsha and Srikanth Srinivasan. On polynomial approximations to AC^0. In Klaus Jansen, Claire Mathieu, José D. P. Rolim, and Chris Umans, editors, *Proceedings*

of the 20th International Workshop on Randomization and Computation (RANDOM), volume 60 of *Leibniz International Proceedings in Informatics*, pages 32:1–32:14. Schloss Dagstuhl, 2016.

[C27] Prahladh Harsha, Rahul Jain, and Jaikumar Radhakrishnan. Partition bound is quadratically tight for product distributions. In Ioannis Chatzigiannakis, Michael Mitzenmacher, Yuval Rabani, and Davide Sangiorgi, editors, *Proceedings of the 43rd International Colloquium of Automata, Languages and Programming (ICALP)*, volume 55 of *Leibniz International Proceedings in Informatics*, pages 135:1–135:13. Schloss Dagstuhl, 2016.

[C28] Amey Bhangale, Prahladh Harsha, and Girish Varma. A characterization of hard-to-cover CSPs. In David Zuckerman, editor, *Proceedings of the 30th Computational Complexity Conference*, volume 33 of *Leibniz International Proceedings in Informatics*, pages 280–303. Schloss Dagstuhl, 2015.

[C29] Irit Dinur, Prahladh Harsha, and Guy Kindler. Polynomially low error PCPs with polyloglog n queries via modular composition. In Rocco A. Servedio and Ronitt Rubinfeld, editors, *Proceedings of the 47th ACM Symposium on Theory of Computing (STOC)*, pages 267–276, 2015.

[C30] Irit Dinur, Prahladh Harsha, Srikanth Srinivasan, and Girish Varma. Derandomikszed Graph Product Results Using the Low Degree Long Code. In Ernst W. Mayr and Nicolas Ollinger, editors, *Proceedings of the 32nd International Symposium on Theoretical Aspects of Computer Science (STACS)*, volume 30 of *Leibniz International Proceedings in Informatics*, pages 275–287. Schloss Dagstuhl, 2015.

[C31] Venkat Guruswami, Prahladh Harsha, Johan Hstad, Srikanth Srinivasan, and Girish Varma. Super-polylogarithmic hypergraph coloring hardness via low-degree long codes. In David B. Shmoys, editor, *Proceedings of the 46th ACM Symposium on Theory of Computing (STOC)*, pages 614–623, 2014.

[C32] Prahladh Harsha and Rahul Jain. A strong direct product theorem for the tribes function via the smooth-rectangle bound. In Anil Seth and Nisheeth K. Vishnoi, editors, *Proceedings of the 33rd IARCS Annual Conference on Foundations of Software Technology and Theoretical Computer Science (FSTTCS)*, volume 24 of *Leibniz International Proceedings in Informatics*, pages 141–152. Schloss Dagstuhl, 2013.

[C33] Steve Chien, Prahladh Harsha, Alistair Sinclair, and Srikanth Srinivasan. Almost settling the hardness of noncommutative determinant. In Lance Fortnow and Salil P. Vadhan, editors, *Proceedings of the 43rd ACM Symposium on Theory of Computing (STOC)*, pages 499–508, 2011.

[C34] Prahladh Harsha, Adam Klivans, and Raghu Meka. An invariance principle for polytopes. In Leonard J. Schulman, editor, *Proceedings of the 42nd ACM Symposium on Theory of Computing (STOC)*, pages 543–552, 2010.

[C35] Ilias Diakonikolas, Prahladh Harsha, Adam Klivans, Raghu Meka, Prasad Raghavendra, Rocco Servedio, and Li-Yang Tan. Bounding the average sensitivity and noise sensitivity of polynomial threshold functions. In Leonard J. Schulman, editor, *Proceedings of the 42nd ACM Symposium on Theory of Computing (STOC)*, pages 533–542, 2010.

[C36] Irit Dinur and Prahladh Harsha. Composition of low-error 2-query PCPs using decodable PCPs. In Daniel A. Spielman, editor, *Proceedings of the 50th IEEE Symposium on Foundations of Computer Science (FOCS)*, pages 472–481, 2009.

[C37] Venkat Chandrasekaran, Nathan Srebro, and Prahladh Harsha. Complexity of inference in graphical models. In David A. McAllester and Petri Myllymäki, editors, *Proceedings of the 24th Conference on Uncertainty in Artificial Intelligence (UAI)*. AUAI Press, 2008.

[C38] Eli Ben-Sasson, Prahladh Harsha, Oded Lachish, and Arie Matsliah. Sound 3-query PCPPs are long. In Luca Aceto, Ivan Damgård, Leslie Ann Goldberg, Magnús M. Halldórsson,

Anna Ingólfsdóttir, and Igor Walukiewicz, editors, *Proceedings of the 35th International Colloquium of Automata, Languages and Programming (ICALP), Part I*, volume 5125 of *Lecture Notes in Computer Science*, pages 686–697. Springer, 2008.

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[C40] Prahladh Harsha, Rahul Jain, David McAllester, and Jaikumar Radhakrishnan. The communication complexity of correlation. In Peter Bro Miltersen, editor, *Proceedings of the 22nd IEEE Conference on Computational Complexity*, pages 10–23, 2007.

[C41] Eli Ben-Sasson, Oded Goldreich, Prahladh Harsha, Madhu Sudan, and Salil Vadhan. Short PCPs verifiable in polylogarithmic time. In Luca Trevisan, editor, *Proceedings of the 20th IEEE Conference on Computational Complexity*, pages 120–134, 2005. Full version available at `http://www.tcs.tifr.res.in/~prahladh/papers/BGHSV2/BGHSV2005.pdf`.

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[C45] Prahladh Harsha and Madhu Sudan. Small PCPs with low query complexity. In Afonso Ferreira and Horst Reichel, editors, *Proceedings of the 18th Annual Symposium on Theoretical Aspects of Computer Science (STACS)*, volume 2010 of *Lecture Notes in Computer Science*, pages 327–338. Springer, 2001.

Surveys/Expository Articles/Blogposts

[S1] Abhibhav Garg, Prahladh Harsha, Mrinal Kumar, Ramprasad Saptharishi, and Ashutosh Shankar. An exposition of recent list-size bounds of FRS codes. (survey), 2025.

[S2] Siddharth Bhandari and Prahladh Harsha. A note on the explicit constructions of tree codes over polylogarithmic-sized alphabet. (manuscript), 2020.

[S3] Prahladh Harsha. The blooming of the c^3 LTC flowers [blogpost], Sep 2022. Calvin Café: The Simons Institute Blog.

[S4] Prahladh Harsha. Research vignette: The many dimensions of high-dimensional expanders [blogpost], June 2020. Calvin Café: The Simons Institute Blog.

[S5] Prahladh Harsha. Locally testable codes. In Ming-Yang Kao, editor, *Encyclopedia of Algorithms*, pages 1–6. Springer, 2016.

Manuscripts

[M1] Soham Chatterjee, Prahladh Harsha, and Mrinal Kumar. Deterministic list decoding of Reed-Solomon codes. (manuscript).

[M2] Rohan Goyal, Prahladh Harsha, Mrinal Kumar, and Ashutosh Shankar. Fast list-recovery of univariate multiplicity and folded Reed-Solomon codes. (manuscript).

[M3] Yotam Dikstein, Irit Dinur, Prahladh Harsha, and Noga Ron-Zewi. Locally testable codes via high-dimensional expanders. (manuscript), 2020.

[M4] Prahladh Harsha, Sandeep Juneja, Preetam Patil, Nihesh Rathod, Ramprasad Saptharishi, A. Y. Sarath, Sharad Sriram, Piyush Srivastava, Rajesh Sundaresan, and Nidhin Koshy Vaidhiyan. COVID-19 Epidemic Study II: Phased Emergence from the Lockdown in Mumbai. (manuscript), 2020.

[M5] Prahladh Harsha, Sandeep Juneja, Daksh Mittal, and Ramprasad Saptharishi. COVID-19 Epidemic in Mumbai: Projections, full economic opening, and containment zones versus contact tracing and testing: An Update. (manuscript), 2020.

Courses Taught

TIFR	Minicourse on Quantum Coding Theory (half course)	Monsoon 2025
TIFR	Toolkit for Theoretical Computer Science (co-taught with Piyush Srivastava)	Winter/Summer 2025
TIFR	Coding theory (co-taught with Mrinal Kumar)	Winter/Summer 2024
TIFR	PCPs & limits of approximation algorithms	Winter/Summer 2023
TIFR	Toolkit for Theoretical Computer Science (co-taught with Piyush Srivastava)	Winter/Summer 2023
TIFR	Coding theory	Monsoon 2022
TIFR	Pseudorandomness (co-taught with Ramprasad Saptharishi)	Monsoon 2021
TIFR	Toolkit for Theoretical Computer Science (co-taught with Piyush Srivastava)	Winter/Summer 2021
TIFR	Computational Complexity (co-taught with Ramprasad Saptharishi)	Winter/Summer 2021
TIFR	Computational Complexity	Winter/Summer 2020
TIFR	Spectral Methods in Computer Science and Combinatorics	Winter/Summer 2019
TIFR	Toolkit for Theoretical Computer Science (co-taught with Piyush Srivastava)	Monsoon 2018
TIFR	Computational Complexity	Winter/Summer 2018
TIFR	Analysis of Boolean Functions	Monsoon 2017
TIFR	Coding theory: An Algorithmic Viewpoint	Monsoon 2016
TIFR	Expander Graphs: Constructions and Applications (co-taught with Anish Ghosh)	Winter/Summer 2016
TIFR	Math Structures for Computer Science (co-taught with Jaikumar Radhakrishnan)	Monsoon 2015
TIFR	PCPs & limits of approximation (two module course)	Winter/Summer 2015
TIFR	Probability and Computing	Monsoon 2014
TIFR	Computational Complexity	Winter/Summer 2014
TIFR	Computational Complexity	Winter/Summer 2013
TIFR	Computational Complexity	Winter/Summer 2012

TIFR & IMSc	Communication Complexity (co-taught with Meena Mahajan and Jaikumar Radhakrishnan)	Monsoon 2011
TIFR	Computational Complexity	Winter/Summer 2011
TIFR & IMSc	Limits of Approximation Algorithms: PCPs and Unique Games	Winter/Summer 2010
DIMACS	Tutorial on Limits of Approximation Algorithms: PCPs and Unique Games (co-organized with Moses Charikar)	June 2009
Univ. Chicago	PCPs, codes and inapproximability	Autumn 2007
Stanford	Expanders in Computer Science (co-taught with Cynthia Dwork)	Spring 2005

Mumbai, India, December 6, 2025