Nikhil S. Mande

Education and work experience

Nov 2020 –present	**Researcher**, *Algorithms and Complexity group, CWI*, Amsterdam, The Netherlands.
Dec 2018 –Sep 2020	**Postdoc**, *Georgetown University*, Washington D.C., USA.
Aug 2013 –Nov 2018	**Ph.D.**, *TIFR*, Mumbai, India. Computer Science
2013	**M.Sc.**, *CMI*, Chennai, India. Applications of Mathematics with a specialization in Computational Mathematics.
2010	**B.Math. (Hons.)**, *ISI*, Bengaluru, India.

Theses and projects

2018	*Communication Complexity of XOR Functions*, Ph.D. thesis, TIFR Mumbai. Advisor: Arkadev Chattopadhyay
2013	*Spectral Graph Theory*, M.Sc. thesis, CMI, Chennai. Advisor: Prajakta Nimbhorkar
2009	*Minimum variance hedging of American and European options using the binomial model*, Summer project, Tata Consultancy Services, Hyderabad. Advisor: M. Vidyasagar. Sponsored by the Indian Academy of Sciences.

Awards and honors

2019	TIFR Alumni Association-Sasken Best Thesis Award for the Best PhD Thesis in Technology and Computer Sciences
2013	CMI Gold Medal of Excellence
2016-18	TCS Research Scholar Fellowship

nikhil.mande@cwi.nl • *https://mande-nikhil.github.io/*

Research interests

I am broadly interested in the area of computational complexity theory. More specifically, I have an interest in approximation theory, (classical and quantum)(query complexity, communication complexity), quantum computing, Boolean circuit complexity, Fourier analysis of Boolean functions, and the connections between them.

Professional service

Reviewer/subreviewer for FOCS, STOC, QIP, FSTTCS, CCC, ICALP, STACS, TQC, RANDOM, ISAAC, SICOMP, IEEE Trans. IT, ToC, QIC, Comput. Comp., ACM ToCT, DISOPT

I have been a member of the Science Popularization and Public Outreach Committee of TIFR.

Coordinator of the Student Seminar ($\approx$ Theory lunch) in STCS, TIFR from 2014-18.

Teaching experience

2016 TA for Arkadev Chattopadhyay for the course *Automata and Computability*

2013 TA for Prajakta Nimbhorkar for the course *Design and Analysis of Algorithms*

Extracurricular activities

I have held several national records in the category of blindfolded speedcubing and solving the Rubik's cube in the fewest number of moves (fewest moves challenge) in the past. My full speedcubing profile can be found here. I have been associated with the World Cube Association as a senior delegate for India and South East Asia, and as a member of the WCA Regulations Committee.

Links

- DBLP
- Google Scholar

Publications

As is conventional in my area of research, all author lists in the following sections are sorted alphabetically in the last name. Publications are listed reverse chronologically in year of publication.

Journal Publications

[1] Mark Bun, Nikhil S. Mande, and Justin Thaler. "Sign-rank Can Increase under Intersection". In: *ACM Trans. Comput. Theory* 13.4 (2021).

nikhil.mande@cwi.nl • *https://mande-nikhil.github.io/*

Earlier version in ICALP 2019.
ECCC Report.

[2] Arkadev Chattopadhyay, Meena Mahajan, Nikhil S. Mande, and Nitin Saurabh. "Lower bounds for linear decision lists". In: *Chic. J. Theor. Comput. Sci.* (2020).
ECCC report.

[3] Arkadev Chattopadhyay, Nikhil S. Mande, and Suhail Sherif. "The Log-Approximate-Rank Conjecture Is False". In: *J. ACM* 67.4 (2020).
Earlier version in STOC 2019.
Invited talk at HALG 2020.
ECCC report.

[4] Arkadev Chattopadhyay and Nikhil S. Mande. "Separation of Unbounded-Error Models in Multi-Party Communication Complexity". In: *Theory Comput.* 14.1 (2018).
ECCC report.

Conference Publications

[5] Sourav Chakraborty, Nikhil S. Mande, Rajat Mittal, Tulasimohan Molli, Manaswi Paraashar, and Swagato Sanyal. "Tight Chang's-lemma-type bounds for Boolean functions". In: *FSTTCS*. 2021.
arXiv preprint.

[6] Sourav Chakraborty, Arkadev Chattopadhyay, Nikhil S. Mande, and Manaswi Paraashar. "Quantum Query-To-Communication Simulation Needs a Logarithmic Overhead". In: *CCC*. 2020.
ECCC report.

[7] Nikhil S. Mande and Swagato Sanyal. "On Parity Decision Trees for Fourier-Sparse Boolean Functions". In: *FSTTCS*. 2020.
ECCC report.

[8] Nikhil S. Mande, Justin Thaler, and Shuchen Zhu. "Improved Approximate Degree Bounds for k-Distinctness". In: *TQC*. 2020.
ECCC report.

[9] Andrej Bogdanov, Nikhil S. Mande, Justin Thaler, and Christopher Williamson. "Approximate Degree, Secret Sharing, and Concentration Phenomena". In: *APPROX/RANDOM*. 2019.
ECCC Report.

[10] Arkadev Chattopadhyay and Nikhil S. Mande. "A Short List of Equalities Induces Large Sign Rank". In: *FOCS*. 2018.
ECCC Report of an earlier version.

[11] Arkadev Chattopadhyay and Nikhil S. Mande. "A Lifting Theorem with Applications to Symmetric Functions". In: *FSTTCS*. 2017.
ECCC Report of an extended version.

Preprints

[12] Nikhil S. Mande and Swagato Sanyal. *One-way communication complexity and non-adaptive decision trees*. 2021.
ECCC Report.

[13] Nikhil S. Mande and Ronald de Wolf. *Tight Bounds for the Randomized and Quantum Communication Complexities of Equality with Small Error*. 2021.
ECCC Report.

[14] Sourav Chakraborty, Arkadev Chattopadhyay, Peter Høyer, Nikhil S. Mande, Manaswi Paraashar, and Ronald de Wolf. *Symmetry and Quantum Query-to-Communication Simulation*. 2020.
arXiv preprint.

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