



Nikhil S. Mande

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EDUCATION AND WORK EXPERIENCE

Researcher | *Algorithms and Complexity Group*

Centrum Wiskunde & Informatica

2020-present
Amsterdam, The Netherlands

Postdoc | *Computer Science*

Georgetown University

Hosted by Justin Thaler

2018-20
Washington, D.C., USA

Ph.D. | *Computer Science*

Tata Institute of Fundamental Research

Thesis title: Communication Complexity of XOR functions

Advisor: Arkadev Chattopadhyay

2018
Mumbai, India

M.Sc. | *Applications of Mathematics*

Chennai Mathematical Institute

Specialization: Computational Mathematics

2013
Chennai, India

B. Math. (Hons.)

Indian Statistical Institute

2010
Bengaluru, India

AWARDS AND HONOURS

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

RESEARCH INTERESTS

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

PROJECTS AND THESES

Communication Complexity of XOR Functions

TIFR, Mumbai

Ph. D. thesis, advisor: Arkadev Chattopadhyay

2018

Spectral Graph Theory

CMI, Chennai

M. Sc. thesis, advisor: Prajakta Nimbhorkar

2013

Minimum variance hedging of American and European options using the binomial model

Tata Consultancy Services, Hyderabad

Summer project under the guidance of M. Vidyasagar. Sponsored by the Indian Academy of Sciences

2009

JOURNAL PUBLICATIONS

- The Log-Approximate-Rank Conjecture is False** 2020
with Arkadev Chattopadhyay and Suhail Sherif
Journal of the ACM
Earlier version in STOC, 2019
Invited talk at HALG 2020.
[ECCC Report](#)
- Lower Bounds for Linear Decision Lists** 2020
with Arkadev Chattopadhyay, Meena Mahajan and Nitin Saurabh
Chicago Journal of Theoretical Computer Science
[ECCC Report](#)
- Separation of Unbounded-Error Models in Multiparty Communication Complexity** 2018
with Arkadev Chattopadhyay
Theory of Computing
[ECCC Report](#)

CONFERENCE PUBLICATIONS

- On Parity Decision Trees for Fourier-Sparse Boolean Functions** 2020
with Swagato Sanyal
FSTTCS, 2020
[arXiv preprint](#)
- Quantum Query-to-Communication Simulation Needs a Logarithmic Overhead** 2020
with Sourav Chakraborty, Arkadev Chattopadhyay and Manaswi Paraashar
CCC, 2020
Presented as a contributed talk at QIP, 2020
[ECCC Report](#)
- Improved Approximate Degree Bounds For k-distinctness** 2020
with Justin Thaler and Shuchen Zhu
TQC, 2020
[ECCC Report](#)
- Approximate Degree, Secret Sharing, and Concentration Phenomena** 2019
with Andrej Bogdanov, Justin Thaler and Christopher Williamson
APPROX-RANDOM, 2019
[ECCC Report](#)
- Sign-Rank Can Increase Under Intersection** 2019
with Mark Bun and Justin Thaler
ICALP, 2019
[ECCC Report](#)
- A Short List of Equalities Induces Large Sign Rank** 2018
with Arkadev Chattopadhyay
FOCS, 2018
[ECCC Report](#) of an earlier version, titled "Weights at the Bottom Matter When the Top is Heavy"

A Lifting Theorem with Applications to Symmetric Functions

2017

with Arkadev Chattopadhyay

FSTTCS, 2017

PREPRINTS

Symmetry and Quantum Query-to-Communication Simulation

2020

with Sourav Chakraborty, Arkadev Chattopadhyay, Peter Høyer, Manaswi Paraashar and Ronald de Wolf

[arXiv preprint](#)

Tight Chang's-lemma-type bounds for Boolean functions

2020

with Sourav Chakraborty, Rajat Mittal, Tulasimohan Molli, Manaswi Paraashar and Swagato Sanyal

[arXiv preprint](#)

Dual polynomials and communication complexity of XOR functions

2017

with Arkadev Chattopadhyay

[arXiv preprint](#)

This is an extended version of "A Lifting Theorem with Applications to Symmetric Functions"

PROFESSIONAL SERVICE

- Reviewer/subreviewer for FOCS, STOC, QIP, FSTTCS, CCC, ICALP, STACS, RANDOM, ISAAC, SICOMP, IEEE Trans. IT, ToC, 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.

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.

TEACHING EXPERIENCE

- TA for Arkadev Chattopadhyay for the course *Automata and Computability*, 2016
- TA for Prajakta Nimbhorkar for the course *Design and Analysis of Algorithms*, 2013

LINKS

[DBLP](#)

[Google Scholar](#)