Nikhil S. Mande

+31 0 620358276
nikhil.s.mande@gmail.com
https://mande-nikhil.github.io/

Education and work experience

Researcher | ***Algorithms and Complexity Group*** 2020-present
Centrum Wiskunde & Informatica Amsterdam, The Netherlands

Postdoc | ***Computer Science*** 2018-20
Georgetown University Washington, D.C., USA
Hosted by Justin Thaler

Ph.D. | ***Computer Science*** 2018
Tata Institute of Fundamental Research Mumbai, India
Thesis title: Communication Complexity of XOR functions
Advisor: Arkadev Chattopadhyay

M.Sc. | ***Applications of Mathematics*** 2013
Chennai Mathematical Institute Chennai, India
Specialization: Computational Mathematics

B. Math. (Hons.) 2010
Indian Statistical Institute 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 2018
TIFR, Mumbai
Ph. D. thesis, advisor: Arkadev Chattopadhyay

Spectral Graph Theory 2013
CMI, Chennai
M. Sc. thesis, advisor: Prajakta Nimbhorkar

Minimum variance hedging of American and European options using the binomial model 2009
Tata Consultancy Services, Hyderabad
Summer project under the guidance of M. Vidyasagar. Sponsored by the Indian Academy of Sciences

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
ECCC report

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

One-way communication complexity and non-adaptive decision trees 2021
with Swagato Sanyal
ECCC report

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, 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.

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