

# Nikhil S. Mande

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Born: September 29, 1989  
Nationality: Indian

## Current position

*Post-Doctoral Fellow*, [Department of Computer Science, Georgetown University, Washington, DC](#)

## Research interests

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

## Education

- Present (Dec, 2018 - ongoing): Post-doctoral fellow, [Department of Computer Science, Georgetown University, Washington, DC](#). Hosted by [Justin Thaler](#)
- 2018 (November, 2018) PhD in Computer Science, [School of Technology and Computer Science, TIFR, Mumbai](#)
- 2013 MSc in Applications of Mathematics (specialization: computational mathematics), [CMI, Chennai](#)
- 2010 BMATH(HONS), [ISI, Bangalore](#)

## Projects and theses

- 2018 PhD Thesis: “[Communication Complexity of XOR Functions](#)”,  
Advisor: [Arkadev Chattopadhyay](#)
- 2014-2015 Project as part of PhD credits requirement titled “On the complexity of powering over finite fields in constant depth circuits” at TIFR under the guidance of [Arkadev Chattopadhyay](#)
- 2013 Masters thesis: “Spectral Graph Theory” at CMI, under the guidance of [Prajakta Nimbhorkar](#)
- 2009 “Minimum variance hedging of American and European options using the binomial model” at TCS, Hyderabad under the guidance of [M. Vidyasagar](#). Sponsored by the [Indian Academy of Sciences](#)

## Awards

- 2019 TIFR Alumni Association-Sasken Best Thesis Award for the Best PhD Thesis in Technology and Computer Sciences

2016-2018 TCS Research Scholar Fellowship  
2013 CMI Gold Medal of Excellence

## Publications

### JOURNAL ARTICLE

2018 “Separation of Unbounded-Error Models in Multiparty Communication Complexity”, with [Arkadev Chattopadhyay](#),  
in *Theory of Computing*  
[ECCC report](#)

### CONFERENCE PUBLICATIONS

2019 “Approximate Degree, Secret Sharing, and Concentration Phenomena”, with [Andrej Bogdanov](#),  
[Justin Thaler](#) and [Christopher Williamson](#),  
in *RANDOM, 2019*  
[ECCC Report](#)

2019 “Sign-Rank Can Increase Under Intersection”, with [Mark Bun](#) and [Justin Thaler](#),  
in *ICALP, 2019*  
[ECCC Report](#)

2019 “The Log-Approximate-Rank Conjecture is False”, with [Arkadev Chattopadhyay](#) and [Suhail Sherif](#),  
in *STOC, 2019*  
[ECCC Report](#)

Invited to *Theory of Computing*, and *SICOMP* special issue for STOC, 2019

2018 “A Short List of Equalities Induces Large Sign Rank”, with [Arkadev Chattopadhyay](#),  
in *FOCS, 2018*.  
[ECCC Report of an earlier version](#)

2017 “A Lifting Theorem with Applications to Symmetric Functions”, with [Arkadev Chattopadhyay](#),  
in *FSTTCS, 2017*.  
[ECCC report of an extended version](#) titled “Dual Polynomials and Communication Complexity of XOR Functions”

### PREPRINTS

2019 “Quantum Query-to-Communication Simulation Needs a Logarithmic Overhead”, with [Sourav Chakraborty](#), [Arkadev Chattopadhyay](#) and [Manaswi Paraashar](#), 2019  
[ECCC Report](#)

Contributed talk at *QIP, 2020*

2019 “Lower Bounds for Linear Decision Lists”, with [Arkadev Chattopadhyay](#), [Meena Mahajan](#) and [Nitin Saurabh](#)  
[ECCC Report](#)

## Selected talks

2019 “Sign-Rank Can Increase Under Intersection” (talks given at TIFR, IIT Bombay).

2019 “A Short List of Equalities Indices Large Sign Rank”, invited speaker at [Spring 2019 Conference on Applied Mathematics, George Washington University](#), Washington D.C.

2017-2018 “Weights at the Bottom Matter When the Top is Heavy” (talks given at Tel Aviv University, Hebrew University of Jerusalem, Carnegie Mellon University, Columbia University). [Slides](#)

2016 “Small-Error Versus Unbounded-Error Protocols in the NOF Model” at [Low-Depth Complexity](#)

2016 [Workshop](#), St. Petersburg.  
2016 “Unbounded-Error Communication Complexity of XOR Functions” at [NMI Workshop on Complexity Theory](#), IIT Gandhinagar. [Video](#)

## 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*

## Professional activities and services

Reviewer/subreviewer for FOCS, STOC, FSTTCS, CCC, ICALP, STACS, RANDOM, ISAAC, SICOMP, IEEE Trans. IT  
2014-2016 [Student seminar](#) coordinator, STCS, TIFR  
2017 Co-organizer, [STCS day](#), TIFR.

## 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.