

# Swagato Sanyal

## Curriculum Vitae

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Date of Birth: August 29, 1986.  
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### Research Interests

Theoretical Computer Science, Algorithms, Computational Complexity, Analysis of Boolean Functions.

### Current Position

Since June, 2018    Assistant Professor    Department of Computer Science, IIT Kharagpur.

### Past Positions

April, 2017 –                      Post-doctoral                      Centre for Quantum Technology (National University Singapore)  
April, 2018                      Research Fellow                      and Nanyang Technological University, Singapore.

February 10, 2017 –                      Post-doctoral                      School of Technology and Computer Science,  
April 5, 2017                      Visiting Fellow                      Tata Institute of Fundamental Research, Mumbai.

### Education

January, 2017    Ph.D. in Comp. Sc.                      Tata Institute of Fundamental Research, Mumbai.

June, 2010                      M.Tech in Comp. Sc. & Engg.                      IIT Kanpur.

May, 2008                      B.E. in Comp. Sc. & Engg.                      Jadavpur University, Kolkata.

### Achievements

- Ph.D. thesis titled *Complexity Measures of Boolean functions: Fourier dimension, Fourier sparsity and query complexity* has been chosen for an honorable mention under the ACM India Doctoral Dissertation Award 2018.
- Ph.D. thesis titled *Complexity Measures of Boolean functions: Fourier dimension, Fourier sparsity and query complexity* has been chosen for TIFR Alumni Association-Sasken Award in Computer Science (Best Thesis Award) for the year 2016-17.

### Publications

1. Randomized Query Composition and Product Distributions.  
Swagato Sanyal.  
*STACS 2024, Track A.*
2. On parity decision trees for Fourier-sparse Boolean functions.  
Nikhil S. Mande and Swagato Sanyal.  
*ACM Transactions on Computation Theory (2024), preliminary version appeared in FSTTCS 2020 (Track A).*
3. Optimal Composition Theorem for Randomized Query Complexity.  
Dmitry Gavinsky, Troy Lee, Miklos Santha, Swagato Sanyal.  
*Theory of Computing (2023), preliminary version appeared in ICALP 2019 (Track A).*
4. Decision Tree Complexity versus Block Sensitivity and Degree.  
Rahul Chugh, Supartha Podder and Swagato Sanyal.  
*FSTTCS 2023, Track A.*
5. On the Composition of Randomized Query Complexity and Approximate Degree.  
Sourav Chakraborty, Chandrima Kayal, Rajat Mittal, Manaswi Paraashar, Swagato Sanyal and Nitin Saurabh.  
*RANDOM 2023.*
6. Randomized versus Deterministic Decision Tree Size.  
Arkadev Chattopadhyay, Yogesh Dahiya, Nikhil Mande, Jaikumar Radhakrishnan, Swagato Sanyal.  
*STOC 2023.*
7. Sampling-Based Winner Prediction in District-Based Elections.  
Palash Dey, Debajyoti Kar, Swagato Sanyal.

*AAMAS 2023 (Extended Abstract).*

8. Representation-based Individual Fairness in k-clustering.  
Debjyoti Kar, Mert Kosan, Debmalya Mandal, Sourav Medya, Arlei Silva, Palash Dey and Swagato Sanyal.  
*AAMAS 2023 (Extended Abstract).*
9. Lifting to Parity Decision Trees via Stifling.  
Arkadev Chattopadhyay, Nikhil S. Mande, Swagato Sanyal, Suhail Sherif.  
*ITCS 2023.*
10. One-Way Communication Complexity and Non-Adaptive Decision Trees.  
Nikhil S. Mande, Swagato Sanyal, Suhail Sheriff.  
*STACS 2022.*
11. Tight Chang's-lemma-type bounds for Boolean functions.  
Sourav Chakraborty, Nikhil S. Mande, Rajat Mittal, Tulasimohan Molli, Manaswi Paraashar, Swagato Sanyal.  
*FSTTCS 2021 (Track A).*
12. Quadratically Tight Relations for Randomized Query Complexity.  
Rahul Jain, Hartmut Klauck, Srijita Kundu, Troy Lee, Miklos Santha, Swagato Sanyal and Jevgenjis Vihrovs.  
*Theory of Computing Systems (2020), preliminary version appeared CSR 2018.*
13. Fourier Sparsity and Dimension.  
Swagato Sanyal.  
*Theory of Computing (2019), preliminary version appeared in ICALP 2015 (Track A).*
14. Separation between Deterministic and Randomized Query Complexity.  
Sagnik Mukhopadhyay, Jaikumar Radhakrishnan, Swagato Sanyal.  
*SIAM Journal on Computing (2018), preliminary versions appeared in FSTTCS 2015 (Track A) and FSTTCS 2016 (Track A).*
15. Linear sketching over  $F_2$ .  
Sampath Kannan, Elchanan Mossel, Swagato Sanyal, Grigory Yaroslavtsev.  
*Computational Complexity Conference (CCC 2018).*
16. A Composition Theorem for Randomized Query Complexity.  
Anurag Anshu, Dmitry Gavinsky, Rahul Jain, Srijita Kundu, Troy Lee, Priyanka Mukhopadhyay, Miklos Santha, Swagato Sanyal.  
*FSTTCS 2017.*
17. A wavelength assignment algorithm for de Bruijn WDM networks.  
Monish Chatterjee, Swagato Sanyal, Mita Nasipuri, Uma Bhattacharya.  
*International Journal of Parallel, Emergent and Distributed System (2011).*
18. Necessary and sufficient conditions for success of the metropolis algorithm for optimization.  
Swagato Sanyal, Raja S, Somenath Biswas.  
*Genetic and Evolutionary Computing Conference (GECCO 2010).*
19. A cops and robber game in multidimensional grids.  
Sayan Bhattacharya, Goutam Paul, Swagato Sanyal.  
*Discrete Applied Mathematics (2010).*

## Professional Services

- I have served as a program committee member of FSTTCS 2021 (Track A).
- I have been in the organizing committee of the *5th Annual International Conference on Algorithms and Discrete Applied Mathematics (CALDAM 2019)* held at IIT Kharagpur.
- I am in the organizing team of *Recent Trends in Algorithms 2024* to be held in July 1-3, 2024 at the Indian Association for the Cultivation of Science, Kolkata, India, which is an event meant to expose PhD and masters level students of theoretical computer science in India to the leading research in algorithms happening in India, by means of research seminars delivered by top researchers in Algorithms of India.
- I have served as a reviewer for STOC, FOCS, Journal of the ACM, ACM Transactions on Algorithms, RANDOM, ITCS, STACS, FSTTCS.