

Siddhartha Jain

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🏠 sidjain.me

Education

2022 - present	PhD. in Computer Science The University of Texas at Austin (UT Austin) Advisor: Scott Aaronson
2020 - 2022	MSc. in Computer Science École Polytechnique Fédérale de Lausanne (EPFL)
2016 - 2020	BTech. in Computer Science & Applied Mathematics IIIT Delhi

Publications

FOCS'21 (Invited to Special Issue)	Unambiguous DNFs and Alon-Saks-Seymour with Mika Göös, Shalev Ben-David, Robin Kothari, Kaspars Balodis We get a near-optimal solution to the Alon–Saks–Seymour problem in graph theory (posed in 1991).
CCC'22	Further Collapses in TFNP with Mika Göös, Gilbert Maystre, Alexandros Hollender, Robert Robere, Ran Tao, William Pires We show the surprising collapse: $\text{EOPL} = \text{PLS} \cap \text{PPAD}$.
FOCS'22	Separations in Proof Complexity and TFNP with Mika Göös, Gilbert Maystre, Alexandros Hollender, Robert Robere, Ran Tao, William Pires We show new characterisations for TFNP subclasses, and employ them to complete the picture of black-box relationships for classes defined in the 90's.
RANDOM'22	Communication Complexity of Collision with Mika Göös We prove a polynomial randomised (and quantum) communication lower bound for a natural two party version of the Collision problem: decide whether a given function is 2-1 or 1-1.
Submitted	On the Rational Degree of Boolean Functions and Applications with Vishnu Iyer, Matt Kovacs-Deak, Vinayak M. Kumar, Luke Schaeffer, Daochen Wang, Michael Whitmeyer We prove lower bounds on the Rational degree of all well-known special classes of Boolean functions, and apply them to show that for quantum computers, post-selection and bounded-error are incomparable resources in the black-box model.
In writing	Pigeonhole Principle and Ramsey in TFNP with Jiawei Li, Robert Robere, Zhiyang Xun We introduce a Pigeon Hierarchy and give lower bound techniques for it in the black-box model. We give several applications, including showing that RAMSEY does not reduce to PPP , refuting a conjecture of Goldberg and Papadimitriou.

Employment

2022	Graduate Research Assistant UT Austin Working at QIC with Scott Aaronson.
2021 - 2022	MSc. Research Scholar EPFL Part of the Research Scholar program by the IC department, working with Mika Göös (EPFL).
2019	Research Intern ITCS Shanghai Summer intern with Bundit Laekhanukit (SUFE).

Honors & Awards

2021	Paper invited to SICOMP Special Issue of FOCS 2021
2021	MSc. Research Scholar (EPFL)
2020	Graduation with Honors (IIITD)
2019	Dean's list (IIITD)
Travel grants	Swiss Winter School on Theoretical Computer Science 2023, FOCS'22 NSF Travel grant, IAS Quantum Computation Winter School 2019, IISc Data Science Summer School 2019

Academic

Service (external reviewer)	QIP('24), CCC('23), ITCS('23), ICALP('21, '22), FSTTCS ('22,'23)
Coursework (UT Austin)	Combinatorics and Graph Theory (A)
Coursework (EPFL)	Advanced Algorithms (6/6), Probabilistic Methods in Combinatorics (5.75/6), Computational Complexity (6/6), Information Theory & Coding (6/6)
Coursework (IIITD)	Modern Algorithm Design (A), Randomised Algorithms (A-), Combinatorics and Its Applications (A), Complexity Theory (A), Theory of Computation (A), Discrete Structures (A), Abstract Algebra (A), Number Theory (A+)

Skills

Languages	Hindi: native English: fluent (written and spoken) French: beginner
Programming	Python, \LaTeX , Java (intermediate), scala (intermediate), Qiskit (beginner)