Soham Chatterjee

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EDUCATION

Tata Institute of Fundamental Research   **2024–Present**
Integrated PhD in Computer Science   GPA: 9 (Till third sem)
Chennai Mathematical Institute   **2021–2024**
BSc. in Math and Computer Science   GPA: 8.05, CS Courses GPA: 8.62

PUBLICATIONS

[1] **S. Chatterjee**, P. Harsha, and M. Kumar, "Deterministic list decoding of reed–solomon codes", in *Proceedings of the 58th Annual ACM Symposium on Theory of Computing (STOC 2026)*, To appear, ACM, 2026. arXiv: 2511.05176 `[cs.CC]`.

RESEARCH INTERESTS

I am broadly interested in Error Correcting Codes, Pseudorandomness, Algebra and Computation, Computational Complexity Theory. My current work is focused on efficient unique and list decoding algorithms of good codes and their local decodability/correctability.

INTERNSHIPS

Derandomization of Isolation Lemma over Polytopes

Guide: Rohit Gurjar, Computer Science Department, IIT Bombay   May–July, 24

- Studied about isolation lemma and its derandomization for Bipartite Perfect Matching and Linear Matroid Intersection polytopes.
- We worked on extending the idea of bounding of lattice vectors with 2-approximation of shortest vector for $0-1$ matrices with column sum k.

Quantum Property Testing of Junta Functions and Partially Symmetric Functions

Guide: Arijit Ghosh, ACMU Department, ISI Kolkata   Dec, 23–Jul, 24

- Studied about Quantum Boolean Functions and basics of quantum property testing algorithms.
- I learned about classical and quantum algorithms for Junta function testing.
- We worked on implementing the Blais-Weinstein-Yoshida's algorithm for partially symmetric functions using quantum algorithm with fewer queries.

Factorization of Arithmetic Circuits and Closure Results of Algebraic Complexity Classes

Guide: Nitin Saxena, Computer Science Department, IIT Kanpur   May–July, 23

- Studied the Factorization techniques of Arithmatic Circuites using Newton Iteration and Hensel Lifting.
- Learned about the closure results of the complexity classes VNP, VP, VBP and their border classes.
- We worked on removing the bounded individual degree condition in Oliveira, 2016 paper.

TALKS AND PRESENTATIONS

- Presented the paper 'Subspace Polynomials and List Decoding of Reed Solomon Codes' by Ben-Sasson, Kopparty, Radhakrishnan in the course Advance Coding Theory by Mrinal Kumar.

- Presented the paper on BPL $\subseteq$ SC: Nisan's Pseudorandom Generator in the course Pseudorandomness by Ramprasad Saptharishi. [Slide]
- Presented the paper on $n^{1.62}$ upper bound of the Hurwitz Problem by Pavel Hrubesh in TIFR Student Seminar.

WORKSHOPS AND CONFERENCES

- Complexity Update Meeting, 2026, Institute of Mathematical Sciences, Chennai
- FSTTCS 2025 Conference, BITS Goa
- HDX and Codes Workshop, 2025, ICTS Bangalore
- FSTTCS 2024 Conference, IIT Gandhinagar
- Quantum Computing Semester, 2024, Chennai Mathematical Institute

RELEVENT COURSEWORK

TIFR	Advance Coding Theory	Pseudorandomness
	Algebra, Number Theory & Computation	Complexity Theory
	Combinatorial Optimization	Algorithmic Game Theory
	Algorithms	Probability Theory
	Mathematical Foundations in Computer Science	

CMI	Computer Science Courses:	
	Expander Graphs & Its Applications	Complexity Theory
	Algorithmic Coding Theory	Algebra & Computation
	Quantum Algorithmic Thinking	Quantum Information Theory
	Parallel Algorithms	Design & Analysis of Algorithms
	Theory of Computation	Discrete Mathematics
	Math Courses:	
	Commutative Algebra	Topology
	Rings and Field Theory (Algebra III)	Metric Space (Analysis III)
	Group Theory (Algebra II)	Analysis over Euclidean Space (Analysis II)
	Linear Algebra (Algebra I)	Real Analysis (Analysis I)

ACHIEVEMENTS

- Secured All India Rank 5 in JEST (Joint Entrance Screening Test) 2024.
- Got selected for NISER Bhubaneswar for Bachelors through the NEST exam, 2021.
- Ranked 28 in 12th Statistics Olympiad organised by C R Rao Advanced Institute of Mathematics, Statistics and Computer Science, 2020.

MISCELLANEOUS EXPERIENCE

- Served as a sub-reviewer for STACS, 2026.
- Teaching Assistant:
  - Algorithms, 2025 course taken by T. Kavitha in TIFR.
  - Algebra, Number Theory & Computation, 2026 course taken by Mrinal Kumar in TIFR.
- I have volunteered for various outreach activities at TIFR such as Frontiers of Scince and National Science Day between November 2024 to February 2026 to inspire students to pursue pure science as a vocation and

showcases recent scientific advances to the general public.