Soham Chatterjee

sohamc@cmi.ac.in / sohamchatterjee999@gmail.com • sohamch08.github.io

Education

- **Chennai Mathematical Institute** — **Chennai, Tamilnadu, India**
  B. Sc - Mathematics and Computer Science — *2021 – Ongoing*
- **University of Calcutta** — **Kolkata, West Bengal, India**
  B. Tech 1st Year - Electronics and Communication Engineering — *2020 – 2021*
- **Baranagar Narendranath Vidyamandir** — **Kolkata, West Bengal, India**
  Higher Secondary (12^{th} Standard) — *2018 – 2020*
- **Baranagar Ramakrishna Mission Ashrama High School** — **Kolkata, West Bengal, India**
  Secondary (10^{th} Standard) — *2008 – 2018*

Academic Achievements

- **TIFR Entrance GS, Computer Science** — **TIFR, Mumbai**
  Entrance exam of Computer Science in Tata Institute of Fundamental Research, Mumbai — *2024*
- **JEST, TCS - Rank 5** — **JEST**
  Joint Entrance Screening Test. Entrance for IMSC — *2024*
- **CMI Entrance** — **Chennai Mathematical Institute**
  Entrance exam of Chennai Mathematical Institute — *2021*
- **NEST** — **NISER**
  Entrance exam of National Institute of Science Education and Research (NISER) — *2021*
- **WBJEE - Rank 1893** — **WBJEEB**
  West Bengal Joint Entrance Exam — *2020*
- **12th Statistics Olympiad - Rank 28** — **AIMSCS**
  C R Rao Advanced Institute of Mathematics, Statistics and Computer Science (AIMSCS) — *2020*

Internship

- **Ramanujan's work on theta functions and q-series and their connections with number theory.**
  Under Professor Rupam Barman, IIT Guahati during the summer break in May – Jul, 2022.
- **Computational Number Theroy and Algebra for Algebraic Comlexity Theory**
  Under Professor Nitin Saxena, IIT Kanpur during the winter break in Dec – Jan, 2022.
- **Factorization of Formula Arithmetic Circuits in Algebraic Complexity Theory**
  Under Professor Nitin Saxena, IIT Kanpur during the summer break in May – July, 2023.
- **Quantum Property Testing of Junta Functions and Partially Symmetric Functions.**
  Under Professor Arijit Ghosh, ISI Kolkata during the winter break in Dec, 2023 – Going on.
- **Derandomization of Isolation Lemma**
  Under Professor Rohit Gurjar, IIT Bombay during the summer break in May – Jul, 2024.

Course Projects

- **Presentation on Iterated Mod Problem:: Slides**
  Presented the paper "Iterated Mod Problem" by Howard J. Karloff and Walter L. Ruzzo in Parallel Algorithm and Complexity course.
- **Report on Algebraic Geometric Codes: Link**
  Followed the Survey by Ian Blake, Chris Heegard, Tom Høholdt, and Victor Wei and Gil Cohen's Course
- **Qiskit Implementation of Quantum Circuit of Modular Exponentiation: Link**
  Implemented the paper: "Quantum Networks for Elementary Arithmetic Operations" by Vlatko Vedral, Adriano Barenco and Artur Ekert
- **Qiskit Implementation of Kushlevitz and Mansour Algorithm: Link**
  Implemented the paper: "Learning Decision Trees Using The Fourier Spectrum" by Eyal Kushilevitz and Yishay Mansour
- **Qiskit Implementation of Some Quantum Algorithms: Link**
  Implemented Grover Search for 2×2 sudoku and Iterative Phase Estimation

Workshop, Lecture Serires Attended

- **Quantum Semester Online** — **Chennai Mathematical Institute**
  Chennai, India — *Currently going on: 2024, Jan-May*
- **Sage Days 122** — **Chennai Mathematical Institute**
  Chennai, India — *September, 2023*
- **p-adic Number Theory Lecture Series: Ram Murty** — **Math Dept, University of Mumbai**
  Mumbai, India — *Online: August, 2023*

Topics I Learned

- **Math Topics:-**

  - Real Analysis
  - Analysis over Euclidean Space
  - Analysis over Metric Space
  - Complex Analysis
  - Probability Theory
  - Calculus
  - Differential Equations
  - General Topology
  - Algebraic Topology (Introductory)
  - Linear Algebra
  - Group Theory
  - Ring Theory
  - Field Theory
  - Galois Theory
  - Commutative Algebra
  - Algebraic Curves

- **Computer Science Topics:-**
  - **Theoretical Computer Science Topics:**
    - Design and Analysis of Algorithms - Geevarghese Philip and Samir Dutta
    - Theory of Computation - Narayan Kumar and C. Aiswarya
    - Complexity Theory - Partha Mukhopadhyay
    - Expander Graphs and Application - Partha Mukhopadhyay - (Attending)
    - Higher Dimensional Expanders (Paper: Log Concave Polynomial 2) - Partha Mukhopadhyay - (Attending)
    - Parallel Algorithms and Complexity - Samir Dutta
    - Algorithmic Coding Theory - Amit Kumar Sinhababu
    - Algebra and Computation - Amit Kumar Sinhababu and Sumanta Ghosh - (Attending)
    - Quantum Algorithmic Thinking - Partha Mukhopadhyay
    - Classical and Quantum Information Theory - Arun Padakandla - (Attending)
    - Discrete Mathematics - C Ramya & Partha Mukhopadhyay
    - Arithmetic Circuits - Nitin Saxena
    - Computational Algebra and Number Theory - Nitin Saxena
    - Lambda Calculus - S P Suresh
    - Introductory Concurrent Programming - Madhavan Mukund
  - **Other CS Topics:**
    - Introduction to Functional Programming (Haskell) - S P Suresh
    - Advanced Programming with Python - Samir Dutta
    - Programming Language Concepts using Java - Madhavan Mukund

Computer Skills

- **Programming Languages:** C (Basic), Python (Intermediate), Haskell (Basic), Java (Intermediate), Unix/Linux Shell Scripting, HTML, CSS
- **Technical Skills:** LaTeX(Advanced), Markdown, Git, Basic works in terminal, VIM, Obsidian