Sayak Chakrabarty

Curriculum Vitae

Research Interests

I am interested in Applied Machine Learning, Artificial Intelligence, Data Mining, Network Security and Network Analysis and Planning. I am graduate student at the Security and AI lab at Dartmouth College..

Education

2013 **Secondary Examination**, *South Point High School*, Kolkata, India.

2015 **Higher Secondary Examination**, *South Point High School*, Kolkata, India.

2015–2018 **BSc(Honours) in Mathematics and Computer Science**, *Chennai Mathematical Institute*, Chennai, *India* .

2018–2020 **Masters of Mathematics(MMath)**, *Indian Statistical Institute*, Baranagar, Kolkata, *India* .

2020–2025 **PhD in Computer Science**, *Dartmouth College*, Security and AI Lab, *United States* .

Relevant Courses

2016 **Discrete Mathematics and Graph Theory**, *Prof. Sourav Chakraborty*, Chennai Mathematical Institute, Undergraduate second year.

2017 **Design and Analysis of Algorithms**, *Prof. Prajakta Nimborkhar*, Chennai Mathematical Institute, Undergraduate second year.

2017 **Additive Combinatorics**, *Prof. R. Balasubramanian*, Institute of Mathematical Sciences, Undergraduate second year.

2017 **Stochastic Processes**, *Prof. S. Ramasubramanian*, Indian Statistical Institute, Bangalore.
Undergraduate second year

2019 **Information and Coding Theory**, *Prof. Sourav Chakraborty and Prof. Arijit Ghosh*, Indian Statistical Institute, Masters second year.

2017 **Automata Theory and Computation**, *Prof. Debrup Chakraborty*, Indian Statistical Institute, Masters second year.

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Honours and Awards

2013 **Achievement Cum Diagnostic Test in Mathematics Gold Medalist**, *Exam is taken by the Centre for Pedagogical Studies in Mathematics and I ranked among the top 10 students nationwide.*, Grade 10.

2015 **Top 20 in the Higher Secondary Examination**, *I ranked in the top 20 in the board examination among 0.7 million participants.*, Grade 12.

2017 **Science and Engineering Research Board International Travel Award**, *I was awarded this grant from the Department of Science and Technology for travelling to Poland for publication of a paper in the conference proceedings*, in the second year of undergraduate Studies.

2018 **Chess Award**, *I ranked in the top 5 best players in a chess competition involving all students in Chennai,India*, Venue: Chennai Mathematical Institute.

2019 **International Youth Math Challenge**, *I got selected for the final round after clearing the qualification round.*, Online Event organized by Indian Institute of Technology.

Research Experience

2016 **Summer Internship**, Lattice Cryptography , Indian Statistical Institute, R.C. Bose Centre, Superviser: Prof. Rishiraj Bhattacharya.

I wrote a technical report based on the paper "Using LLL-Reduction for Solving RSA and Factorization Problems" by Alexander May.

2017 **Summer Internship**, Additive Combinatorics and Probability, Harish Chandra Research Institute, Superviser: Prof. Gyan Prakash..

I tried to master the techniques from the book "Additive Combinatorics" by Terence Tao and Van Vu. I almost completed reading the notes of Kannan Soundarajan on Additve Combinatorics.

2019 **Summer Internship**, Coding Theory and MCMC Methods , Indian Statistical Institute, Superviser: Prof. Sourav Chakraborty.

I started my studies with coding theory. I covered reading:
1. Essential Coding Theory by Venkatesan Guruswami, Atri Rudra and Madhu Sudan
2. Optimal Error Correction for Computationally Bounded Noise by Silvio Micali, Chris Peikert, Madhu Sudan

I worked on problems related to estimating number of perfect matchings in bipartite graph and estimating the number of maximal flows in some bipartite graphs using MCMC methods.

Teaching Experience

2017 **Analysis II Teaching Assistant**, *Prof. Sunder Sobers*, Chennai Mathematical Institute, I was the teaching assistant for the undergraduate course Analysis II and taught the first year students..

Publications

1. **The Repeated Divisor Function and Possible Correlation with Highly Composite Numbers**, *2017*, 20^{th} *International Workshop for Young Mathematicians "Number Theory"-The Zaremba Society of Mathematicians - Students of the Jagiellonian University, Krakow, Poland* .
   Coauthor: Arghya Datta
2. **A Number Guessing Game**, *Pi in the Sky*, Issue 22, Pacific Institute for the Mathematical Sciences.
   To appear in 2021

Presentations and Workshops

1. **A Variant of Large Sieve**, 2017, Venue: Institute of Mathematical Sciences.
   I presented the full paper of Ben Green to the audience.
2. **Roth's Theorem**, 2017, Venue: Institute of Mathematical Sciences.
   I presented the proof of Roth's theorem but it was the proof given by T. Gowers.
3. **A Course on Android Malware Analysis**, SEPTEMBER 2020, 3 day Zoom course by ISTS and Google.
   The lectures were delivered by members of the Google Android Security Team.

Technical Strength

Basic	JAVA, Haskell
Intermediate	C, C++, Matlab
Comfortable	Python 3,Latex

Languages

Comfortable	Hindi
Fluent	English, Bengali

Extra Curriculars and Other Educational Experiences

2018	I learnt network programming in python from an online course which included basic concepts on TCP sockets, banner grabbing, NMap and Wireshark,extracting metadata from files, web scraping and scapy
2020	I am extremely interested in chess and play tournaments regularly on `https://lichess.org/`. (Glicko rating 2100+ classical)

References

1. Sourav Chakraborty, email: sourav at isical.ac.in
2. Mridul Nandi, email: mridul at isical dot ac dot in

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