Amit Roy | CS18S022

Indian Institute of Technology Madras

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Research Interests

Boolean functions complexity, Algorithms , Theory of Computation

Education

Program	Institution	%/CGPA	Year
MS (Computer Science and Engg.)	IIT Madras	**8.0/10**	2021
B.Tech. (Computer Science and Engg.)	Institute of Engineering & Management,Kolkata	**8.61/10**	2018
XII - Higher Secondary	Delhi Public School Ranchi	**91.2/100**	2014

Key Projects

Study on Vapnik-Chervonenkis Dimension **January 2019 - Present**

(Ongoing MS Project), Advisor- Prof. Jayalal Sarma *IIT Madras*

We aim to study the complexity of learning Boolean function families and investigate its relations with other circuit complexity measures such as degree, Decision Tree complexity, Branching Program size etc.

Mystery of Negations **Jan - May 2019**

No non-linear lower bounds are known for circuits using negations and effect of such gates in a circuit to a large extent remains a mystery. I am investigating the effect of the presence of negation gates in circuits which pose difficulty towards showing non-linear lower bounds.

Scholastic Achievements

- Secured an All India Rank of 960 out of 107893 applicants in GATE CS 2018.
- Presented 3 papers in IEEE IEMCON 2016 on IoT
  - Energy Efficient Data Centers & smart temperature control system with IoT sensing
  - Smart Asthma Attack Prediction using IoT
  - Smart Traffic & Parking management using IoT
- Secured All India Rank 28 in Indian Engineering Olympiad 2017.

Course Work

- Computability and Complexity
- Modern Complexity Theory
- Advanced Data Structures & Algorithm
- Pseudorandomness
- Logic and Combinatorics
- Sublinear Algorithms

Paper Presentation

- Presented in CoT-meet IIT Madras titled *"Bipartite Perfect Matching as Real Polynomial" by Beniamini and Nisan*
- Presented in CoT-meet IIT Madras titled *"On the Complexity of Boolean Functions in Different Characteristics" by Gopalan, Lovett and Shpilka*
- Presented *"Mystery of Negations" by Stasys Jukna* for the course Modern Complexity Theory
- Presented *"An Elementary Construction of Constant-Degree Expanders" by Alon, Schwartz and Shapira* for the course Pseudorandomness.
- Presented *"Monotonocity Testing" by Goldreich , Goldwasser , Lehman , Ron , Samorodnitsky* for the course Sublinear Algorithms.

Participation in Seminars and Conferences

- Indo-US workshop on Pseudorandomness(July-2019) held at IISc Bangalore .
- Foundations of Software Technology and Theoretical Computer Science-2019 held at IIT Bombay.
- Graphs, Structures and Algorithms(Nov-2019) held at IMSc Chennai.
- Sensitivity, Query Complexity, Communication Complexity and Fourier Analysis of Boolean Function (Feb-2020) held at ISI Kolkata.

Technical Skills

- **Languages**: *Proficient*- C, C++, Latex; *Intermediate*- Java, HTML
- **Operating Systems**: Windows, Ubuntu

Positions of Responsibility

- **Teaching Assistant :** Introduction to Programming, Advanced Data Structures and Algorithms, Pseudorandomness
- Class Committee Meeting Representative for MS scholars.