Manmatha Roy

8th December 1989

https://www.isical.ac.in/∼manmatha/

https://manmatha-roy.github.io/

I am a researcher in theoretical computer science, with a focus on Boolean-valued functions over discrete algebraic structures, their structural properties, and the design of efficient algorithms for learning and testing them. My work finds applications in cryptography, coding theory, and learning theory.

Education

- **PhD in Computer Science** *(Expected) 2025*
  Indian Statistical Institute, Kolkata, India

- **Master in Computer Science** *2020*
  Indian Statistical Institute, Kolkata, India

- **Bachelor of Engineering in Computer Science** *2012*
  Jadavpur University, Kolkata, India

Employment

- **Associate Scientist - A** *Dec 2022 – Present*
  Indian Statistical Institute, Kolkata

- **Visiting Research Scientist** *Sept 2022 – Dec 2022*
  University of Warsaw, Faculty of Mathematics, Informatics, and Mechanics

- **Senior Research Engineer** *July 2020 – Dec 2020*
  R C Bose Center for Cryptology and Security, Indian Statistical Institute, Kolkata

- **Senior Research Engineer** *Sept 2012 – Aug 2018*
  Center for Distributed Computing, Jadavpur University, Kolkata

Research

- **Tight Bounds for Testing Isomorphism of Boolean Functions**
  Swarnalipa Dutta, Arijit Ghosh, Chandrima Kayal, Manaswi Paraashar, and Manmatha Roy
  Submitted

- **Deciding Linear Isomorphism in the Communication World**
  Swarnalipa Dutta, Arijit Ghosh, Chandrima Kayal, Manaswi Paraashar, and Manmatha Roy
  Submitted

- **Testing Fourier Sparsity via Implicit Sensing**
  Arijit Ghosh, Subhamoy Maitra, and Manmatha Roy
  Submitted

- **Testing Fourier Sparsity**
  Arijit Ghosh and Manmatha Roy
  Submitted

- **On Differential Uniformity of Extremal Functions**
  Nikolay Stoyanov Kaleyski and Manmatha Roy
  BFA (2025)

- **Testing Isomorphism of Boolean Functions over Abelian Groups**
  Swarnalipa Dutta, Arijit Ghosh, Chandrima Kayal, Manaswi Paraashar, and Manmatha Roy
  RANDOM (2025)

- **Construction of Maiorana-McFarland type cryptographically significant Boolean functions with good implementation properties**
  Deng Tang, Anupam Chattopadhyay, Manmatha Roy, Bimal Mandal, and Subhamoy Maitra
  Communications in Cryptology (2025)

- **Modifying Bent Functions to Obtain the Balanced Ones with High Nonlinearity**
  Subhamoy Maitra, Bimal Mandal, and Manmatha Roy
  Indocrypt (2022)

- **Experimental Results on Higher-Order Differential Spectra of 6- and 8-bit Invertible S-Boxes**
  Subhamoy Maitra, Bimal Mandal, Deng Tang, and Manmatha Roy
  SPACE (2020)

Teaching

- **2024–25**
  - **Instructor** for **Computing System Security-I**, M.Tech (CrS) Programme, Indian Statistical Institute, Kolkata

  - **Instructor** for **Computing System Security-II**, M.Tech (CrS) Programme, Indian Statistical Institute, Kolkata

- **2023–24**
  - **Instructor** for **Computing System Security-I**, M.Tech (CrS) Programme, Indian Statistical Institute, Kolkata

  - **Instructor** for **Cryptography and Security Implementation**, M.Tech (CrS) Programme, Indian Statistical Institute, Kolkata

- **2022–23**
  - **Instructor** for **Computing System Security-I**, M.Tech (CrS) Programme, Indian Statistical Institute, Kolkata

- **2021–22**
  - **Co-Instructor** for **Cryptology I**, M.Tech (CS & CrS) Programme, Indian Statistical Institute, Kolkata, with **Prof. Subhamoy Maitra**

Miscellaneous

- Organizer for Departmental Reading Group on Sublinear Algorithms

- Organizer for Departmental Reading Group on Probabilistic Methods

- Organizer for Indo Japan Joint Workshop on Quantum Computation and Information (2020)

- Organizer for Workshop on Mission Critical Networks (2019)

- Organizer for International Conference on Information Systems Security (2015)

<u>References</u>

- Bimal Kumar Roy
  Professor (Retd.), Applied Statistics Unit, Indian Statistical Institute, Kolkata
  Ex-Head, R C Bose Center for Cryptology and Security
  Email: bimal@isical.ac.in

- Subhamoy Maitra
  Professor, Applied Statistics Unit, Indian Statistical Institute, Kolkata
  Head, R C Bose Center for Cryptology and Security
  Email: subho@isical.ac.in

- Arijit Ghosh
  Associate Professor, Advanced Computing and Microelectronics Unit, Indian Statistical Institute, Kolkata
  Email: arijitiitkgpster@gmail.com

- Sourav Chakraborty
  Professor, Advanced Computing and Microelectronics Unit, Indian Statistical Institute, Kolkata
  Email: chakraborty.sourav@gmail.com

Updated: Wednesday 13th August, 2025 at 11:05