CHAKRABORTY
Dipayan

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Research interests: identification problems in graphs, domination numbers, graph colorings, graph homomorphisms, graph modification problems, graph algorithms, computational complexity

Last updated: October 11, 2024

Current position

January, 2022–till date (submitted)	**Ph.D in Computer Science — Algorithmique et structure des problèmes d'identification (Structural and algorithmic aspects of identifications problems in graphs)**, *Laboratoire d'Informatique, de Modélisation et d'Optimisation des Systèmes (LIMOS), Université Clermont Auvergne*, France
Director	**Annegret WAGLER**, *LIMOS, Université Clermont Auvergne*, France
Co-supervisor	**Florent FOUCAUD**, *LIMOS, Université Clermont Auvergne*, France
Co-supervisor	**Michael HENNING**, *Department of Mathematics and Applied Mathematics, University of Johannesburg*, South Africa
January, 2023–till date	**Research Associate (academic host: Michael HENNING)**, *Department of Mathematics and Applied Mathematics, University of Johannesburg*, South Africa

Previous positions

January – December, 2021	**Junior Research Fellow (JRF)**, *under SERB-SRG funded project titled "Complexity dichotomies of graph modification problems", Department of Computer Science and Engineering, Indian Institute of Technology Dharwad*, Karnataka, India
2016–2020	**Teaching Faculty (Mathematics)**, *Department of Basic Science & Humanities, Gargi Memorial Institute of Technology, Maulana Abul Kalam Azad University of Technology*, Baruipur, Kolkata, India
2015–2016	**Visiting faculty (Engineering Mathematics)**, *Department of Mathematics, Government College of Engineering and Ceramic Technology, Maulana Abul Kalam Azad University of Technology*, Kolkata, India

Educational trainings

2009–2012	**Master in Mathematics (ALGANT Erasmus Mundus)**, *University of Bordeaux,* France (first year) – *University of Padova,* Italy (second year)
2004–2007	**Bachelor of Science (Hons. in Mathematics)**, *St. Xavier's College, Kolkata, University of Calcutta*, Kolkata, India

Journal Publications

Published **A linear algorithm for radio k-coloring of powers of paths having small diameters**, Dipayan Chakraborty, Soumen Nandi, Sagnik Sen and Supraja DK, *Journal of Computer and System Sciences* 147: 103577 (2025)
`https://doi.org/10.1016/j.jcss.2024.103577`

Published **Progress towards the two-thirds conjecture on locating-total-dominating sets**, Dipayan Chakraborty, Florent Foucaud, Anni Hakanen, Michael Henning and Annegret Wagler, *Discrete Mathematics* 347(12): 114176 (2024)
`https://doi.org/10.1016/j.disc.2024.114176`

Published **On locating and neighbor-locating colorings of sparse graphs**, Dipayan Chakraborty, Florent Foucaud, Soumen Nandi, Sagnik Sen and Supraja DK, *Discrete Applied Mathematics* 358: 366-381 (2024)
`https://doi.org/10.1016/j.dam.2024.07.012`

Published **On three domination-based identification problems in block graphs**, Dipayan Chakraborty, Florent Foucaud, Aline Parreau and Annegret Wagler, *Fundamenta Informaticae (special issue: Iro Honkala's 60th birthday)*, 191(3-4): 197-229 (2024)
`https://doi.org/10.3233/FI-242179`

Published **On clique numbers of colored mixed graphs**, Dipayan Chakraborty, Sandip Das, Soumen Nandi, Debdeep Roy and Sagnik Sen, *Discrete Applied Mathematics* 324: 29-40 (2023)
`https://doi.org/10.1016/j.dam.2022.08.013`

Submitted **Tight (double) exponential bounds for identification problems: Locating-Dominating Set and Test Cover**, Dipayan Chakraborty, Florent Foucaud, Diptapriyo Majumdar and Prafullkumar Tale, *Manuscript* (2024)
(submitted to *SIAM Journal on Discrete Mathematics*)

Submitted **Identifying codes in graphs of given maximum degree: Characterizing trees**, Dipayan Chakraborty, Florent Foucaud, Michael Henning and Tuomo Lehtilä, *Manuscript* (2024)
(submitted to *Journal of Graph Theory*)

Submitted **Identifying codes in triangle-free graphs of bounded maximum degree**, Dipayan Chakraborty, Florent Foucaud, Michael Henning and Tuomo Lehtilä, *Manuscript* (2024)
(submitted to *Discrete Mathematics*)

Submitted **The $n/2$-bound for locating-dominating sets in subcubic graphs**, Dipayan Chakraborty, Anni Hakanen and Tuomo Lehtilä, *Manuscript* (2024)
(submitted to *Graphs and Combinatorics*)

Submitted **Identifying open codes in trees and 4-cycle-free graphs of given maximum degree**, Dipayan Chakraborty, Florent Foucaud and Michael Henning, *Manuscript* (2024)
(submitted to *Discrete Applied Mathematics*)

Conference proceedings

Submitted **On full-separating sets in graphs**, Dipayan Chakraborty and Annegret Wagler, *Manuscript* (2024)
(submitted to the *11th International Conference on Algorithms and Discrete Applied Mathematics (CALDAM)*)

Accepted **Tight (double) exponential bounds for identification problems: Locating-Dominating Set and Test Cover**, Dipayan Chakraborty, Florent Foucaud, Diptapriyo Majumdar and Prafullkumar Tale, *35th International Symposium on Algorithms and Computation (ISAAC), Leibniz International Proceedings in Informatics (2024)*

Published	**Open-separating dominating codes in graphs**, Dipayan Chakraborty and Annegret K. Wagler, *8th International Symposium on Combinatorial Optimization (ISCO), Lecture Notes in Computer Science 14594: 137-151* (2024)
	`https://doi.org/10.1007/978-3-031-60924-4_11`
Published	**Location-Domination Type Problems Under the Mycielski Construction**, Silvia M. Bianchi, Dipayan Chakraborty, Yanina Lucarini and Annegret K. Wagler, *10th International Conference on Algorithms and Discrete Applied Mathematics (CALDAM), Lecture Notes in Computer Science 14508: 255-269 (2024)*
	`https://doi.org/10.1007/978-3-031-52213-0_18`
Published	**Contracting edges to destroy a pattern: A complexity study**, Dipayan Chakraborty and Sandeep RB, *24th International Symposium on Fundamentals of Computation Theory (FCT), Lecture Notes in Computer Science 14292: 118-131 (2023)*
	`https://doi.org/10.1007/978-3-031-43587-4_9`
Published	**Identifying codes in bipartite graphs of given maximum degree**, *with* Dipayan Chakraborty, Florent Foucaud, Tuomo Lehtilä, *XII Latin-American Algorithms, Graphs and Optimization Symposium (LAGOS), Procedia Computer Science 223: 157-165 (2023)*
	`https://doi.org/10.1016/j.procs.2023.08.225`
Published	**A linear algorithm for radio k-coloring powers of paths having small diameter**, Dipayan Chakraborty, Soumen Nandi, Sagnik Sen and DK Supraja, *34th International Workshop on Combinatorial Algorithms (IWOCA), Lecture Notes in Computer Science 13889: 148-159* (2023)
	`https://doi.org/10.1007/978-3-031-34347-6_13`
Published	**On three domination-based identification problems in block graphs**, Dipayan Chakraborty, Florent Foucaud, Aline Parreau and Annegret Wagler, *9th International Conference on Algorithms and Discrete Applied Mathematics (CALDAM), Lecture Notes in Computer Science 13947: 271-283 (2023)*
	`https://doi.org/10.1007/978-3-031-25211-2_21`
Published	**New bounds and constructions for neighbor-locating colorings of graphs**, Dipayan Chakraborty, Florent Foucaud, Soumen Nandi, Sagnik Sen and Supraja DK, *9th International Conference on Algorithms and Discrete Applied Mathematics (CALDAM), Lecture Notes in Computer Science 13947: 121-133 (2023)*
	`https://doi.org/10.1007/978-3-031-25211-2_21`

Conferences / Colloquia / Summer Schools

May, 2024	**École de Printemps en Informatique Théorique**, (EPIT 2024)
	Hosted by: École Normale Supérieure de Lyon
February, 2024	**10th International Conference on Algorithms and Discrete Applied Mathematics**, (CALDAM 2024)
	Hosted by: IIT Bhilai, Chhattisgarh, India
September, 2023	**XII Latin-American Algorithms, Graphs and Optimization Symposium**, (LAGOS 2023)
	Hosted by: Instituto de Matemáticas, UNAM, Juriquilla, Mexico
June, 2023	**CIMPA Research School on Graph Structure and Complex Network Analysis**, (CIMPA GSCN 2023)
	Hosted by: Nesin Mathematics Village, Sirinçe, Izmir, Turkey

February, 2023 **9th International Conference on Algorithms and Discrete Applied Mathematics**, (CALDAM 2023)
Hosted by: DAIICT, Gandhinagar, India

September, **Maribor Graph Theory Conference**, (MGTC 2022)
2022 Hosted by: Faculty of Natural Sciences and Mathematics, University of Maribor, Slovenia

July, 2022 **11th International Colloquium on Graph Theory and Combinatorics**, (ICGT 2022)
Hosted by: LIRMM, Montpellier, France

June, 2022 **School on Graph Theory**, *Murol, France*, (SGT 2022)
Organized by: LIMOS, Université Clermont Auvergne, France

May, 2021 **Annual Meeting of Homomorphisms of Signed Graphs**, (HOSIGRA 2021)
Hosted by: University of Bordeaux, University of Montpellier and University of Paris Diderot, France

Review Contributions

Conference **International Conference on Algorithms and Discrete Applied Mathematics**, *CALDAM*
International Workshop on Combinatorial Algorithms, *IWOCA*
Latin-American Algorithms, Graphs and Optimization Symposium, *LAGOS*
International Conference on Current Trends in Theory and Practice of Computer Science, *SOFSEM*

Journal **Fundamental Informaticae**
The Australasian Journal of Combinatorics

Supervision

May - July, **L3 internship student, Chennai Mathematical Institute, Chennai, India**, *Research*
2024 *topic: Local identification problems in graphs*
Co-supervised with Prof. Florent Foucaud, Université Clermont Auvergne, France

Academic Events

Organizing **41st International Symposium on Theoretical Aspects of Computer Science**, *Clermont-*
Committee *Ferrand, France*, (STACS 2024)
(March, 2024) Hosted by: Université Clermont-Auvergne

Theses

Master thesis, **Mordell-Weil theorems & the Birch and Swinnerton-Dyer conjecture**, *Universita degli*
2012 *Studi di Padova*, Italy
Supervisor **Matteo LONGO**, *Universita degli Studi di Padova*, Italy

Courses Taught

2022-2025 **IUT Clermont Auvergne**, *Université Clermont Auvergne*, Aubière, France

- **Methodes d'Optimisation**
  le Bachelor Universitaire de Technologie (BUT) Informatique – 2nd year

2016–2020 **Gargi Memorial Institute of Technology (GMIT)**, *under Maulana Abul Kalam Azad University of Technology (MAKAUT)*, Kolkata, India

- **Mathematics-I A & B** (Single & Multivariate Calculus ∥ Linear algebra)
  Bachelor of Technology. (B. Tech) – 1st year

- **Mathematics-II A & B** (Probability & Statistics ∥ Multivariate Calculus ∥ Differential Equations ∥ Complex Analysis)
  Bachelor of Technology (B. Tech) – 1st year

- **Mathematics-III** (Differential Calculus ∥ Differential Equations ∥ Partial Differential Equations ∥ Integral Transforms ∥ Probability & Statistics)
  Bachelor of Technology (B. Tech) – 2nd year

- **Mathematics-IV** (Numerical Methods ∥ Abstract Algebra ∥ Basics of Graph Theory)
  Bachelor of Technology (B. Tech) – 2nd year

2015–2016 **Government College of Engineering & Ceramic Technology (GCECT)**, *under Maulana Abul Kalam Azad University of Technology (MAKAUT)*, Kolkata, India

- **Engineering Mathematics** (Probability ∥ Fourier Analysis ∥ Integral Transforms ∥ Ordinary & Partial Differential Equations)
  Bachelor of Technology (B. Tech) – 2nd year

References

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  mahenning@uj.ac.za

- **Sagnik SEN**, *Department of Mathematics, Indian Institute of Technology Dharwad, Karnataka, India*
  sagnik@iitdh.ac.in