Dipayan **CHAKRABORTY**

LIMOS-ISIMA, Université Clermont Auvergne
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https://dipayan5186.github.io/Website/

Research domains: *identification problems in graphs, dominating sets, graph modification problems, graph algorithms, computational & parameterized complexity*

last updated : 28 mars 2025

Professional experience

Feb. 2025 - till date — **Post-doctorate** (supervisor : **Faisal N. Abu-Khzam**), *Department of Computer Science and Mathematics, Lebanese American University*, Lebanon

Jan. 2022 - Janv. 2025 — **PhD scholar**, *Laboratoire d'Informatique, de Modélisation et d'Optimisation des Systèmes (LIMOS), Université Clermont Auvergne*, France

Jan. 2023 - Jan. 2025 — **Reseach associate** (academic host : **Michael Henning**), *Department of Mathematics and Applied Mathematics, University of Johannesburg*, South Africa

Oct. 2022 - Nov. 2024 — **Part-time lecturer**, *Institut universitaire de technologie (IUT), Université Clermont Auvergne*, France

Jan. 2021 - Dec. 2021 — **Contractual researcher**, *as part of the project funded by SERB-SRG and titled "Complexity dichotomies of graph modification problems", Department of Computer Science and Engineering, Indian Institute of Technology Dharwad*, Karnataka, India

Aug. 2016 - Dec. 2020 — **Teaching faculty of mathematics**, *Department of Basic Science & Humanities, Gargi Memorial Institute of Technology, Maulana Abul Kalam Azad University of Technology*, Baruipur, Kolkata, India

Jul. 2015 - Jul. 2016 — **Visiting lecturer in applied engineering mathematics**, *Department of Mathematics, Government College of Engineering and Ceramic Technology, Maulana Abul Kalam Azad University of Technology*, Kolkata, India

Education

Jan. 2022 - Jan. 2025 — **PhD in Computer Science** (defended 9th December 2024)

Thesis title — **Structural and algorithmic aspects of identification problems in graphs**

Laboratoire d'Informatique, de Modélisation et d'Optimisation des Systèmes (LIMOS), Université Clermont Auvergne, France

PhD Jury

Director	**Annegret Wagler**, *Professor, Université Clermont Auvergne*, France
Co-supervisor	**Florent Foucaud**, *Associate professor, Université Clermont Auvergne*, France
Co-supervisor	**Michael Henning**, *Professor, University of Johannesburg*, South Africa
Examiner (President)	**Paul Dorbec**, *Professor, Université de Caen-Normandie*, France
Examiner	**Ralf Klasing**, *Director of Research, CNRS, Université de Bordeaux*, France
Reviewer	**Tero Laihonen**, *Professor, University of Turku*, Finlande
Reviewer	**Arnaud Pêcher**, *Professor, Université de Bordeaux*, France

Sep. 2009 - Mar. 2012 — **Master in mathematics** (ALGANT Erasmus Mundus)

Université de Bordeaux, France (1st year) – Università degli Studi di Padova, Italy (2nd year)

Master thesis defended March 2012 — **Mordell-Weil theorems & the Birch and Swinnerton-Dyer conjecture**, *Università degli Studi di Padova*, Italie

Supervisor — **Matteo Longo**, *Università degli Studi di Padova*, Italy

Aug. 2004 - June 2007 — **Bachelor of Science** (Honours in mathematics)
St. Xavier's College, Kolkata, University of Calcutta, Kolkata, India

Publications and submissions in journals

Published (Jan. 2025) — **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 (Dec. 2024) — **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 (Dec. 2024) — **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 (July 2024) — **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 (Jan. 2023) — **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 (Mar. 2025) — **On the Structural Parameterizations of Locating-Dominating Set and Test Cover**, Dipayan Chakraborty, Florent Foucaud, Diptapriyo Majumdar and Prafullkumar Tale, *Manuscript* (2025)
(submitted to *Journal of Computer and System Sciences*)

Submitted (Mar. 2025) — **Partitioning the vertex set of a graph into a dominating set and a locating dominating set**, Dipayan Chakraborty, Florent Foucaud, Michael Henning and Tero Laihonen, *Manuscript* (2025)
(submitted to *Information Processing Letters*)

Submitted (Mar. 2025) — **On full-separating sets and related codes in graphs**, Dipayan Chakraborty and Annegret K. Wagler, *Manuscript* (2025)
(submitted to *Discrete Applied Mathematics*)

Submitted (Feb. 2025) — **On lower bounds for cardinalities of several separating-dominating codes in graphs**, Dipayan Chakraborty and Annegret K. Wagler, *Manuscript* (2025)
(submitted to *Discrete Applied Mathematics*)

Submitted (Jan. 2025) — **On open-separating dominating sets in graphs**, Dipayan Chakraborty and Annegret K. Wagler, *Manuscript* (2025)
(submitted to *Discrete Applied Mathematics*)

Submitted (Sep. 2024) — **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 (Aug. 2024) — **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*)

Submitted (July 2024) **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 (June 2024) **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 (Apr. 2024) **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*)

Publications and submisions in conferences with proceedings

Accepted **Structural parameterization of locating-dominating set and test cover**, Dipayan Chakraborty, Florent Foucaud, Diptapriyo Majumdar and Prafullkumar Tale, *14th International Conference on Algorithms and Complexity (CIAC 2025)*

Published (Feb. 2025) **On full-separating sets in graphs**, Dipayan Chakraborty and Annegret Wagler, *11th International Conference on Algorithms and Discrete Applied Mathematics (CALDAM), Lecture Notes in Computer Science 15536 :73-84 (2025)*
https://doi.org/10.1007/978-3-031-83438-7_7

Published (Dec. 2024) **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 322 : 19 :1-19 :18 (2024)*
https://doi.org/10.4230/LIPIcs.ISAAC.2024.19

Published (May 2024) **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 (Jan. 2024) **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 (Sep. 2023) **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 (Sep. 2023) **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 (June 2023) **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 (Jan. 2023) **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 (Jan. 2023) **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_9

Conferences / Summer Schools

November 2024 **Journées Graphes et Algorithmes**, (JGA 2024)
Organised by : Université de Bourgogne, France

May 2024 **École de Printemps en Informatique Théorique**, (EPIT 2024)
Organised by : École Normale Supérieure de Lyon, France

February 2024 **10th International Conference on Algorithms and Discrete Applied Mathematics**, (CALDAM 2024)
Organised by : IIT Bhilai, Chhattisgarh, Inde

September 2023 **XII Latin-American Algorithms, Graphs and Optimization Symposium**, (LAGOS 2023)
Organised by : Instituto de Matemáticas, UNAM, Juriquilla, Mexique

June 2023 **CIMPA Research School on Graph Structure and Complex Network Analysis**, (CIMPA GSCN 2023)
Organised by : Nesin Mathematics Village, Sirinçe, Izmir, Turkie

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

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

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

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

May 2021 **Annual Meeting of Homomorphisms of Signed Graphs**, (HOSIGRA 2021)
Organised by : Université de Bordeaux, Université de Montpellier et Université de Paris Diderot, France

Reviews for journals and conferences

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*
International Workshop on Graph-Theoretic Concepts in Computer Science, *WG*

Journal **Fundamenta Informaticae**
The Australasian Journal of Combinatorics

Research supervision

May 2024 - July 2024 **Intern of 3rd year bachelor's degree, Chennai Mathematical Institute, Chennai, India**, *Subject of research : Local identification problems in graphs*
Co-supervised with Prof. Florent Foucaud, Université Clermont Auvergne, France

Organisation of scientific events

Organising committee (Mar. 2024) **41st International Symposium on Theoretical Aspects of Computer Science**, *Clermont-Ferrand, France*, (STACS 2024)
Organised by : Université Clermont-Auvergne, France

Teaching activities

2022-2025 || Univ. **IUT Clermont Auvergne**, *Université Clermont Auvergne*, Aubière, France

Courses taught

- **Methodes d'Optimisation** (TD+TP || 2022-2024 || 42 heures)
  University Bachelor of Technology (BUT) Computer Science – 2nd année

2016-2020 || Univ. **Gargi Memorial Institute of Technology (GMIT)**, *Maulana Abul Kalam Azad University of Technology (MAKAUT)*, Kolkata, India

Courses taught

- **Graph theory and algorithms** (Course+Tutorial || 2016-2020 || 84 hours)
  Bachelor of Technology. (B. Tech)
- **Linear algebra** (Course+Tutorial || 2016-2020 || 120 hours)
  Bachelor of Technology. (B. Tech)
- **Abstract algebra** (Course+Tutotial || 2016-2020 || 75 hours)
  Bachelor of Technology. (B. Tech)
- **Probability** (Course+Tutorial || 2016-2020 || 132 hours)
  Bachelor of Technology. (B. Tech)
- **Real analysis** (Course+Tutorial || 2016-2019 || 66 hours)
  Bachelor of Technology. (B. Tech)
- **Complex analysis** (Course+Tutorial || 2016-2020 || 127 hours)
  Bachelor of Technology. (B. Tech)
- **Numerical methods** (Course+Tutorial+Practicals || 2016-2020 || 143 hours)
  Bachelor of Technology. (B. Tech)
- **Differential calculus** (Course+Tutorial || 2016-2020 || 134 hours)
  Bachelor of Technology. (B. Tech)
- **Integral transforms** (Course+Tutorial || 2016-2019 || 64 hours)
  Bachelor of Technology. (B. Tech)

2015-2016 || Univ. **Government College of Engineering & Ceramic Technology (GCECT)**, *Maulana Abul Kalam Azad University of Technology (MAKAUT)*, Kolkata, Inde

Courses taught

- **Probability** (Course+Tutorial || 2016-2020 || 23 hours)
  Bachelor of Technology. (B. Tech)
- **Integral transforms** (Course+Tutorial || 2015-2016 || 17 hours)
  Bachelor of Technology. (B. Tech)
- **Fourier analysis** (Course+Tutorial || 2015-2016 || 17 hours)
  Bachelor of Technology. (B. Tech)
- **Differential equations** (Course+Tutorial || 2015-2016 || 20 hours)
  Bachelor of Technology. (B. Tech)

Academic References

- **Florent Foucaud**, *LIMOS, Université Clermont Auvergne*, France
  florent.foucaud@uca.fr
- **Annegret Wagler**, *LIMOS, Université Clermont Auvergne*, France
  annegret.wagler@limos.fr
- **Michael Henning**, *Department of Mathematics and Applied Mathematics, University of Johannesburg*, Afrique de Sud
  mahenning@uj.ac.za
- **Sagnik Sen**, *Department of Mathematics, Indian Institute of Technology Dharwad, Karnataka*, Inde
  sagnik@iitdh.ac.in