Debasish Pattanayak

Curriculum Vitae & Achivements

✉ drdebmath@gmail.com

🌐 drdebmath.github.io

Experience

Carleton University | POSTDOCTORAL RESEARCHER
MENTOR: PROF. NICOLA SANTORO   OCT 2023 - PRESENT
- To design algorithms for mobile robots.

Université du Québec en Outaouais | POSTDOCTORAL RESEARCHER
MENTOR: PROF. ANDRZEJ PELC   OCT 2022 - OCT 2023
- To design algorithms for weak mobile agents on graphs.

LUISS Guido Carli | POSTDOCTORAL RESEARCHER
MENTOR: PROF. GIUSEPPE F. ITALIANO   OCT 2020 - OCT 2022
- To design algorithms for harnessing data from graphs.

Indian Statistical Institute Kolkata | VISITING SCIENTIST
MENTOR: DR. ANISUR RAHAMAN MOLLA   MARCH - SEP 2020
- To design distributed algorithms for robots with low memory in graphs.

University of Vienna | SERB OVERSEAS VISITING DOCTORAL FELLOWSHIP
MENTOR: PROF. STEFAN SCHMID   JULY - DECEMBER 2019
- To design distributed algorithms for robots with minimal capabilities in the context of pattern formation, evacuation and convergence.

Japan Advanced Institute of Science and Technology | VISITING RESEARCHER
MENTOR: PROF. ATSUKO MIYAJI   MAY - JULY 2013
- To explore methods of fast scalar multiplication in elliptic curves.

Education

Ph.D. in COMPUTER SCIENCE
DEPARTMENT OF MATHEMATICS, INDIAN INSTITUTE OF TECHNOLOGY GUWAHATI   2014-2020
ADVISORS: PROF. PARTHA SARATHI MANDAL & DR. H. RAMESH   CPI: 8.81/10

- Date of Award: September 22, 2020
- Date of Defense: July 16, 2020
- Title: Distributed Algorithms for Autonomous Mobile Robots
- Research Areas: Distributed Algorithms, Mobile Robots, Self-stabilization, Fault-tolerance, Randomized Algorithms

B.Tech. in MATHEMATICS AND COMPUTING   2010 - 2014
DEPARTMENT OF MATHEMATICS, INDIAN INSTITUTE OF TECHNOLOGY GUWAHATI   CPI: 7.87/10
BTECH PROJECT: STUDY OF NEGATIVE CONTINUED FRACTIONS | ADVISOR: DR. VINAY WAGH
- To develop an algorithm for factorization of integers using negative continued fraction.

Awards

- Awarded Distributed Computing Chair Research Grant, 2022 to work at UQO, Canada.
- Awarded LUISS Guido Carli research grant titled "AHeAD: efficient Algorithms for HArnessing networked Data".
- Best Doctoral Thesis award from Department of Mathematics, IIT Guwahati.
- Best Paper award at ICDCIT 2023, Bhubaneswar.
- Best Poster Award at Doctoral Symposium, ICDCN 2020, Kolkata.
- Awarded SERB Overseas Visiting Doctoral Fellowship 2018-2019 to visit the University of Vienna for six months.
- Qualified IIT-JEE 2010 among top 0.7%.
- Secured 8th position in High School Certificate Examination, Odisha in 2008.

Publications

Journals

- Debasish Pattanayak, Kaushik Mondal, H. Ramesh, and Partha Sarathi Mandal. **Gathering of mobile robots with weak multiplicity detection in presence of crash-faults.** *J. Parallel Distributed Comp. (Elsevier)*, 123:145–155, 2019.
- Debasish Pattanayak, John Augustine, and Partha Sarathi Mandal. **Randomized Gathering of Asynchronous Mobile Robots.** *Theoretical Computer Science (Elsevier)* 858: 64-80 (2021).
- Dibakar Saha, Debasish Pattanayak, and Partha Sarathi Mandal. **Surveillance of Uneven Surface with Self-organizing Unmanned Aerial Vehicles.** *IEEE Transactions on Mobile Computing* 21(4): 1449-1462 (2022)
- Debasish Pattanayak, Kaushik Mondal, Partha Sarathi Mandal, and Stefan Schmid. **Area Convergence of Weaker Robots with Additional Capabilities.** *The Computer Journal (Oxford)* 65(5): 1306-1319 (2022)
- Subhajit Pramanick, Sai Vamshi Samala, Debasish Pattanayak, Partha Sarathi Mandal. **Distributed Algorithms for Filling MIS Vertices of an Arbitrary Graph by Myopic Luminous Robots.** *Theoretical Computer Science (Elsevier)* vol 978 (2023).
- Debasish Pattanayak, Andrzej Pelc. **Deterministic Treasure Hunt and Rendezvous in Arbitrary Connected Graphs.** *Information Processing Letters (Elsevier)* vol 185 (2024).

Conferences

- Debasish Pattanayak, Gokarna Sharma. **Time-Color tradeoff on Uniform Circle Formation by Asynchronous Robots.** *IPDPS 2024* [To appear]
- Debasish Pattanayak, Subhash Bhagat, Sruti Gan Choudhuri, Anisur Rahaman Molla. **Maximal Independent Set via Mobile Robots.** *ICDCN'24* [To appear]
- Debasish Pattanayak, Gokarna Sharma, Partha Sarathi Mandal. **Dispersion of Mobile Robots in spite of Faults.** *SSS'23*:414-429.
- Subhajit Pramanick, Sai Vamshi Samala, Debasish Pattanayak, Partha Sarathi Mandal. **Filling MIS Vertices by Myopic Luminous Robots.** *ICDCIT'23*:3-19 **(Best Paper Award)**
- Giuseppe F. Italiano, Debasish Pattanayak, and Gokarna Sharma, **Dispersion of Mobile Robots on Directed Anonymous Graphs.** *SIROCCO 2022*: 191-211
- Kartikey Kant, Debasish Pattanayak, and Partha Sarathi Mandal. **Fort Formation by an Automaton.** *COMSNET'21*: 540-547
- Debasish Pattanayak, Dibakar Saha, Debarati Mitra, and Partha Sarathi Mandal. **A Reconstructive Model for Identifying the Global Spread in a Pandemic** *ICDCIT'21*: 188-202
- Debasish Pattanayak, Gokarna Sharma, and Partha Sarathi Mandal. **Dispersion of Mobile Robots Tolerating Faults.** WDALFR, ICDCN (Adjunct Volume) 2021: 133-138.
- Debasish Pattanayak, Klaus-Tycho Foerster, Partha Sarathi Mandal, Stefan Schmid. **Conic Formation in Presence of Faulty Robots.** *ALGOSENSORS'20*: 170-185, Pisa, Italy, September 7-10, 2020.
- Dibakar Saha, Debasish Pattanayak, and Partha Sarathi Mandal. **Surveillance of uneven surface with unmanned aerial vehicles**. In *Proceedings of the 21st International Conference on Distributed Computing and Networking, ICDCN 2020, (ACM)*, Kolkata, India, January 4-7, 2020.
- Debasish Pattanayak, H. Ramesh, and Partha Sarathi Mandal. **Chauffeuring a crashed robot from a disk**. In *ALGOSENSORS 2019*, Munich, Germany, September 12-13, 2019, pp. 177–191.
- Debasish Pattanayak, H. Ramesh, Partha Sarathi Mandal, and Stefan Schmid. **Evacuating two robots from two unknown exits on the perimeter of a disk with wireless communication**. In *ICDCN 2018* (ACM), Varanasi, India, January 4-7, 2018, pages 20:1–20:4, 2018.
- Debasish Pattanayak, Kaushik Mondal, Partha Sarathi Mandal, and Stefan Schmid. **Convergence of even simpler robots without position information**. In *NETYS 2017, Marrakech, Morocco, May 17-19, 2017, Proceedings* (Springer), pages 69–85, 2017.
- Debasish Pattanayak, Kaushik Mondal, H. Ramesh, Partha Sarathi Mandal. **Fault-Tolerant Gathering of Mobile Robots with Weak Multiplicity Detection**. In *ICDCN 2017* (ACM), Hyderabad, India, January 5-7, 2017.

Abstracts/Posters

- Debasish Pattanayak, H. Ramesh, Partha Sarathi Mandal. **Collaborative Evacuation of Mobile Robots**. In Doctoral Symposium ICDCN 2020, Kolkata, India, January 4-7, 2020. **(Best poster award)**

Preprints

- Loukas Georgiadis, Giuseppe F. Italiano, Evangelos Kosinas, Debasish Pattanayak. **On maximal 3-edge-connected subgraphs of undirected graphs.** *CoRR* abs/2211.06521 (2022)
- Debasish Pattanayak, Andrzej Pelc. **Computing Functions by Teams of Deterministic Finite Automata.** *CoRR* abs/2310.01151 (2023)

Teaching

LUISS |Co-Teaching

- Artificial Intelligence and Machine Learning (Bachelor) September - December 2021
- Machine Learning (Master) February - May 2022

IIT Guwahati | Teaching Assistant

- Data Structures Lab with OOP
- Matrix Computations Lab with MATLAB
- Computer Programming Lab with C
- Data Structures and Algorithms Lab with C++

Pedagogical Training: CodeIn Summer School 2022, Sibenik, Croatia.

Skills

Programming
- C •C++ •Python •LaTeX •HTML •CSS •MATLAB •Mathematica •Markdown

Python Libraries
- SkLearn •PyTorch •Pandas •Numpy •Matplotlib

Community Services

- Reviewer for ICDCN 2017, ICDCN 2019, OPODIS 2019, CALDAM 2020, SIROCCO 2020, SSS 2021, ALGOSENSORS 2021, ISAAC 2021, ICDCS 2021, SODA 2022, ICDCN 2022, SSS 2023, IEEE Access, TCS, JPDC, Distributed Computing.
- Part of the Organizing Committee of the 13th International Conference and Workshop on Algorithms and Computation (WALCOM), 2019.
- PC member of ICDCN Doctoral Symposium 2022, ICDCIT'23, ICDCIT'24 and SIROCCO'24.

References

Prof. Partha Sarathi Mandal
Professor
Department of Mathematics
Indian Institute of Technology Guwahati
Guwahati - 781039, Assam, India.
email: psm@iitg.ac.in

Prof. Giuseppe F. Italiano
Professor
Department of Business and Management
LUISS University
Rome, Italy.
email: gitaliano@luiss.it

Prof. Andrzej Pelc
Professor
Department of Computer Science and Engineering
Université du Québec en Outaouais
Gatineau, Canada
email: andrzej.pelc@uqo.ca

Last Updated: December 28, 2023