# Debasish Pattanayak

Curriculum Vitae & Achivements

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## Personal

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| Name | Debasish Pattanayak |
| Citizenship | Indian |
| Date of Birth | $1^{st}$ August 1992 |
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| Languages | Odia (Native), English (Fluent), Hindi (Fluent), Japanese (Conversational) |

## 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 Defense: 16 July 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

## Experience

**LUISS Guido Carli** | Postdoctoral Researcher
Mentor: Prof. Giuseppe F. Italiano Oct 2020 - Current

- 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 OVDF Fellow
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 Advance Institute of Science and Technology** | Visiting Researcher
Mentor: Prof. Atsuko Miyaji May - July 2013

- Explored methods of fast scalar multiplication in elliptic curve with faster point addition including tripling and halving.
- Used hybrid base chain expansion of integers and joint forms.

## Awards

- 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 Poster Award at Doctoral Symposium, $21^{st}$ International Conference on Distributed Computing and Networking, ICDCN 2020, Kolkata.
- Awarded SERB Overseas Visiting Doctoral Fellowship 2018-2019 to visit the University of Vienna for six months.

## Projects

**BTech Project** |Title: Study of Negative Continued Fractions
Advisor: Dr. Vinay Wagh Aug 2013 - April 2014

- Explored continued fractions and its properties. Proposed negative continued fraction, its properties and relation with simple continued fraction. Developed an algorithm for factorization of integers using negative continued fraction.

# Publications

## Journals

- Debasish Pattanayak, John Augustine, and Partha Sarathi Mandal. **Randomized Gathering of Asynchronous Mobile Robots.** Theoretical Computer Science (Elsevier) 858: 64-80 (2021).
- Debasish Pattanayak, Kaushik Mondal, Partha Sarathi Mandal, and Stefan Schmid. **Area Convergence of Weaker Robots with Additional Capabilities.** *The Computer Journal (Oxford)* 2021; bxaa182.
- Dibakar Saha, Debasish Pattanayak, and Partha Sarathi Mandal. **Surveillance of Uneven Surface with Self-organizing Unmanned Aerial Vehicles.** *IEEE Transactions on Mobile Computing* doi: 10.1109/TMC.2020.3022075
- Debasish Pattanayak, Kaushik Mondal, H. Ramesh, and Partha Sarathi Mandal. **Gathering of mobile robots with weak multiplicity detection in presence of crash-faults.** *Journal of Parallel and Distributed Computing (Elsevier)*, 123:145–155, 2019.

## Conferences

- Giuseppe F. Italiano, Debasish Pattanayak, and Gokarna Sharma, **Dispersion of Mobile Robots on Directed Anonymous Graphs.** *SIROCCO 2022* [To Appear]
- Kartikey Kant, Debasish Pattanayak, and Partha Sarathi Mandal. **Fort Formation by an Automaton.** *COMSNET'21*
- Debasish Pattanayak, Dibakar Saha, Debarati Mitra, and Partha Sarathi Mandal. **A Reconstructive Model for Identifying the Global Spread in a Pandemic** *ICDCIT'21*
- 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*, 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)

# 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++

# 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, IEEE Access, TCS, JPDC.
- 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.

# References

**Prof. Partha Sarathi Mandal**
Professor
Department of Mathematics
Indian Institute of Technology Guwahati
Guwahati - 781039, Assam, India.
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**Prof. Giuseppe F. Italiano**
Professor of Computer Science
Department of Business and Management
LUISS Guido Carli University
Rome, Italy.
email: gitaliano@luiss.it

**Prof. Dr. Stefan Schmid**
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Germany
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