

Dr. Mridini Mahadev Gawas. Ph.D.
mridinigawas@unigoa.ac.in

Assistant Professor,
Mathematics Discipline
School of Physical and Applied Sciences,
Goa University
Taleigao Plateau
Panaji-Goa, INDIA. 403 206



- **Scopus Author ID: 59239536800**
[🔗 Scopus Author Profile](#)
- [Scopus Author Profile](#)
- **Google Scholar ID: S1orvdQAAAAJ**
[🔗 Google Scholar Profile](#)

Career Objective

To contribute to a research-driven academic institution by delivering high-quality teaching, promoting critical thinking and problem-solving abilities, and enriching the curriculum through model-based and applied learning strategies.

Professional Experience: {Total Experience 2012-2025 (13 years)}

- Assistant Professor in Mathematics, School of Physical and Applied Sciences, Goa University (01 November 2022 - till date)
- Assistant Professor in Mathematics, P.E.S's College of Arts and Science, Farmagudi Ponda Goa (02 July 2012- 31 October 2022).

Qualification:

- Ph.D. in Mathematics. BITS Pilani K.K. Birla Goa campus, India 2022.
- M.Sc. (Mathematics), Goa University, 2012.
- B.Sc. (Physics-Mathematics), Goa, Goa University, 2010. Gold Medalist

Skills:

- Mathematical modelling and analytical problem-solving
- Differential equations and dynamical systems analysis
- Computational tools and numerical simulation (MATLAB, Python, R)

- Research guidance, academic writing, and effective teaching

Ph.D. Thesis Title: " Lie Symmetries and Discontinuity Wave Propagation for Certain Hyperbolic Systems of Partial Differential Equations ".

This thesis investigates the application of Lie symmetry analysis to certain hyperbolic systems of partial differential equations arising in physical and engineering contexts. It explores how symmetry reductions can be used to obtain exact and invariant solutions that describe wave phenomena. The study gives special emphasis to discontinuity wave propagation, analyzing the formation and evolution of shock and weak waves within hyperbolic systems. Analytical results are supported by rigorous mathematical derivations to understand wave interactions and stability. Overall, the work contributes to a deeper theoretical understanding of nonlinear wave propagation using symmetry-based methods.

Supervisor:

- Dr. Manoj Kumar Pandey (BITS Pilani, India)

Research Interest:

- Mathematical modelling of real-world phenomena in biology, epidemiology, and physics
- Lie symmetries and group-theoretic methods for differential equations
- Nonlinear partial differential equations and wave propagation
- Computational and numerical methods for applied mathematics
- Integration of deep learning and data-driven approaches with mathematical models

International Conferences and Workshop Attended:

1. 9th International World Conference on Smart Trends in Systems, Security and Sustainability (WorldS4 2025), August 2025, **London UK.**
2. 2nd International Conference on Artificial Intelligence and Networking (ICAIN-2025), **Dubai**
3. 18th IEEE International Symposium on Embedded Multicore/Many-core Systems-on-Chip (MCSoc 2025), **Singapore.**
4. International Conference on Mathematical Computer Engineering - 2018 (ICMCE-2018) at Vellore Institute of Technology, Chennai, India
5. 9th International Conference on Mathematics and Computing at BITS Goa, January 2023.
6. International Conference on Applications of Fluid Dynamics (ICAFD) at VIT Vellore, December 2018.
7. "Research Grant Writing Workshop", Goa State Higher Education Council, 8th September 2023
8. "International workshop on Optimization Algorithms, Graph theory and Geometrical flows in Modern Computing" at VIT Chennai 23-24 Nov 2018.

9. National level conference in “Knot theory and related topics” Dhempe college of Arts and Science, 23-24th February 2018.
10. One day workshop on “Advanced Programming techniques in MATLAB at BITS Goa, 24/07/2015.
11. Three days workshop on “Latex for Beginners” by RSN college of Arts and science Farmagudi, 6-8 Nov 2017.
12. Advanced level workshop on “Variational Analysis and Optimization”, IIT Gandhinagar, 208 March 2015.
13. Advanced level training program on Differential Equations: Theory , Computations and Applications, at BITS Goa, 25th May – 14th June, 2015.
14. MTA Regional Conference Goa 2024 organized by MTA(I) , SCERT and DHE on 27th and 28th January 2024 at SCERT Building, Porvorim Goa.
15. Two-Day Workshop on “Innovating, Designing, Modelling, Characterization and Simulation of Materials and Bio-Molecule using in silico Solution Suite, ASAP , Goa University on Jan. 18th and 19th.
16. Half Day Brainstorming Workshop for volunteering Faculty Members on the theme "Demystifying Research and taking Research to the Doorsteps of Schools ", organized by Goa State Research Foundation on 18h April, 2024, at SCERT Building, Alto, Porvorim-Goa.

Faculty Development Programs Attended:

1. FDP on “ Experiential Learning, Creative Thinking and Hands-on Pedagogy” by DHE, 16th-20th January 2023
2. 4- Week Faculty Induction Programme organized by Teaching Learning Centre Ramanujan College, University of Delhi from 22nd October - 20th November 2023 and obtained A+ grade.
3. FDP on NEP Orientation and Sensitization 05th Feb to 13th Feb 2024 organized by University of Hyderabad.
4. Refresher Course in Mathematics and its applications, UGC – Malaviya Mission Teacher Training Centre(Human Resource Development Centre) UNIVERSITY OF ALLAHABAD, from November 06 to November 19, 2024

Invited Speaker Engagements

1. “Mathematical Definitions of Infinity and How to Measure it”, Govt. Higher Secondary Khandola, Dec 22
2. “Mathematical Modelling and Differential Equations”, GVM’s College of Education, Ponda Goa. Jan. 24
3. “Mathematical Modelling and Differential Equations”, GVM’s College of Commerce and economics, Ponda Goa. Jan. 24
4. “Vedic Mathematics”, Govt. High School, Fatarpa. Feb 24
5. “Tricks in Vedic Mathematics”, Vidya Vikas Academy, Margao. Feb 24
6. “Linear Algebra : Unleashing it’s power in Computer Science”, BCA Students, GVM’s College of Commerce and economics, Ponda Goa. Feb. 24

Peer Reviewed Publications: (Research Publications)

Sr. No	Publication	Scopus/Web of Science	Number of publications
1	Reviewed Journals (Web of Science)	7 Web of Science	7
2	Book Published (ISBN)	International	1
4	Book Chapter	1 Scopus	1
5	International Conference	5 Scopus	5

Journal Publications:

1. **Sweta Govekar**, P. K. Pradhan and Manoj Pandey, Evolution of Contact and Discontinuity Waves in Two Phase Drift Flux Model, **Int. J. Appl. Comput. Math.**, doi.org/10.1007/s40819-020- 00883-6. (SCI 2.18 IF)
2. Dia Zeidan, **Sweta Govekar** and Manoj Pandey, Discontinuity wave interactions in generalized magnetogasdynamics, **Acta Astronautica**, 180, 2021, 110-114. (SCI 3.14 IF)
3. Dia Zeidan, Manoj Pandey and **Sweta Govekar**, Interaction of shock and discontinuity waves at the stellar surfaces, **Physics of Fluids**, 34, 066111, 2022. (SCI 4.3 IF)
4. Gawas Mahadev A., **Sweta Govekar.**, “A novel selective cross layer based routing scheme using ACO method for vehicular networks” **Journal of Networks and Computer Application** (SCI 5.7 IF). 2019
5. Gawas Mahadev A., **Sweta Govekar** “State-of-art and open issues of cross-layer design and QOS routing in internet of vehicles”. **Wireless Personal Communications 116 (3), 2261-2297.** (SCI 2.03 IF)
6. Gawas Mahadev A, S.S. Govekar “An integrative approach for secure data sharing in vehicular edge computing using Blockchain” **Peer-to-Peer Networking and Applications (Springer), 1-19.** (SCI 2.6 IF).
7. G. Kulandaivelu, A. Taluja, **M. Gawas**, and R. K. Nath, “Automated breast cancer diagnosis optimized with higher-order attribute-enhancing heterogeneous graph neural networks using mammogram images,” **Biomedical Signal Processing and Control**, vol. 97, p. 106659, 2024, ISSN: 1746-8094. (SCI 4.9 IF)

Book Published

1. Mahadev Gawas, Mridini Gawas “ Data Science with Machine Learning and Deep Learning: A mathematical and Algorithmic guide”, Scientific International Publishing House. 2024 ISBN 978-93-5515-469-9

Book Chapter:

1. Mridini Gawas, “A comprehensive review of mathematical models for forecasting population growth: exploring current frontiers”. **COMPUTATIONAL MATHEMATICS IN ENGINEERING, De Gruyter 2026**

International Conferences (SCOPUS):

1. Gawas, M.A, **Gawas Mridini**, “Efficient Multi Objective Cross Layer Approach for 802.11e over MANETs.” 14th International Wireless Communications and Mobile Computing Conference (IWCMC 2018). **Limassol, Cyprus.**
2. Gawas, M., **Gawas, M.** (2026). Integrating Thermal and Fecal Image Analysis Using Deep Learning for Early Detection of Poultry Diseases. **WorldS4 2025 London UK.** Lecture Notes in Networks and Systems, vol 1727. Springer.
3. Gawas, M., **Gawas, M.** (2026). Mathematical Modeling for Predictive Maintenance: Leveraging AI and Machine Learning for System Optimization and Failure Prediction. **WorldS4 2025 London UK.** Lecture Notes in Networks and Systems, vol 1728. Springer.
4. Gawas, M.A., **Gawas, M.** (2025). Optimizing Energy Efficiency and Quality of Service in Fog Computing with a Decentralized Blockchain Framework. **WorldS4 2025 London UK.** Lecture Notes in Networks and Systems, vol 1730. Springer.
5. M. Gawas, H. Patil and **M. Gawas**, "Detection of Avian Influenza-Infected Chickens Using a Multi-Modal Audio-Visual Convolutional Neural Network Optimized for Indian Poultry Farms," *2025 IEEE 18th International Symposium on Embedded Multicore/Many-core Systems-on-Chip (MCSoc)*, **Singapore**, 2025, pp. 574-581.

International Conferences and Workshop Attended (Abroad):

1. 9th International World Conference on Smart Trends in Systems, Security and Sustainability (WorldS4 2025), August 2025, **London UK.**
2. 2nd International Conference on Artificial Intelligence and Networking (ICAIn-2025), **Dubai**
3. 18th IEEE International Symposium on Embedded Multicore/Many-core Systems-on-Chip (MCSoc 2025), **Singapore.**

Conferences and Workshop Conducted:

1. Conducted Two Day Workshop on Differential Equations and Mathematical Modelling in Dec 2023.
2. Conducted Winter School for Undergraduate Mathematics Students from Goa on the theme “Winter School on Computational and Applied Mathematics”, 2024.
3. Conducted Winter School for Undergraduate Physics/Mathematics Students from Goa on the theme “Solving Reality: A hands-on workshop on Applied Differential Equations and Computational Methods”

Sponsored Research Projects:

1. **Title:** A Synergistic Approach to Dengue Prediction in Goa: Mathematical Modelling and Deep Learning

Funding Agency: Goa State Research(GSRF), Government of Goa

Role: Sponsored Research Project (Principal Investigator)

Project Description: This research project aims to develop an accurate and reliable dengue prediction framework for Goa by integrating mathematical modelling with deep learning techniques in a synergistic manner. The study will combine epidemiological models that capture dengue transmission dynamics with data-driven deep learning models capable of learning complex patterns from climatic, environmental, and historical case data. By leveraging the strengths of both approaches, the project seeks to improve early warning capabilities, enhance outbreak forecasting accuracy, and support timely public health interventions. The outcomes are expected to aid health authorities in proactive decision-making and contribute to more effective dengue surveillance and control strategies tailored to the regional characteristics of Goa.

Project Duration: 2024-2026 (Two years) Completed

Total Project Cost: ₹5,00,000 (Rupees Five Lakhs Only)

2. Title: Lie Symmetries and Group Invariant Solutions of Cancer Invasion Mathematical Model Deep Learning

Funding Agency: Department of Science and Technology (DST), Government of Goa

Role: Sponsored Research Project (Principal Investigator)

Project Description: This research project focuses on the analysis and enhancement of cancer invasion mathematical models through the application of Lie symmetries, group invariant solutions, and deep learning techniques. The study will employ Lie group theory to identify symmetries of nonlinear partial differential equations governing cancer invasion, enabling the derivation of exact and reduced-form solutions that provide deeper insight into tumor growth and invasion dynamics. These analytical results will be complemented by deep learning models to approximate complex solution behaviors, accelerate simulations, and handle parameter uncertainties using data-driven learning. By integrating rigorous mathematical analysis with modern artificial intelligence methods, the project aims to improve the understanding, prediction, and computational efficiency of cancer invasion models, with potential implications for cancer research and therapeutic strategy development.

Project Duration: 2025-2028 (Three years)

Total Project Cost: 10,64,500 (Ten lakh sixty-four thousand five hundred)

Administrative Responsibility:

1. Member of Career Counselling Cell, Goa University.
2. Member of Board of Studies and Examinations of Mathematics, Goa University

Personal Information

Date of birth: 20/12/1989

Gender: Female

Marital status: Married

Languages Known: Konkani, English, Hindi, and Marathi

Hobbies: Plantation, Badminton, Swimming, Listening music

Permanent Address: Hno: 27, Shree Krupa Niwas, Amona Marcela Goa.

Phone Number: 8668858583

I declare that the foregoing information is correct and complete to the best of my knowledge and belief and nothing has been concealed or distorted.