

Dr. Sanjay Kumar Mohanty

Research Assistant Professor, Department of Mathematics

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Research Interests

Time-dependent Hydroelasticity, Explainable Artificial Intelligence in Finance and Biology

Teaching Interests

Calculus, Probability and Statistics, Deep Learning, Financial Mathematics

Education

Ph.D. 2014

Indian Institute of Technology (IIT) Kharagpur

Mathematical Techniques for Time Dependent Hydroelastic Analysis of Floating Structures

Academic Positions

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| • Research Assistant Professor, VIT Vellore | 2026–Present |
| • Assistant Professor, VIT Vellore | 2018–2026 |
| • Visiting Researcher, University of Newcastle, Australia | May-June 2024 |
| • Assistant Professor, BIT International Center Muscat, Oman | 2015–2018 |

Administrative Responsibilities

- Editorial Board member, Scientific Reports, Nature group journals, July 2025 to date
- Editorial Board member, Scientific Reviews, Nature group journals, January 2026 to date
- Editorial Board member, International Journal of Mathematics and Mathematical Sciences, Wiley, January 2026 to date
- Lab in charge High performance computing Lab(DST funded) VIT Vellore
- Committee member National Assessment and Accreditation Council (NAAC), VIT Vellore, 2024
- Committee member, National Board of Accreditation, VIT Vellore, 2025
- Committee member Oman Academic Accreditation Authority (OAAA), BIT Mesra International center Muscat, 2017

Curriculum Development

- Financial Mathematics
- Financial Analytics
- Deep Learning

Reviewer of the Journals

Journal of Fluid Mechanics, IEEE Transactions on Instrumentation and Measurement, IEEE Transactions on Artificial Intelligence, Wave Motion, Physics of Fluids, Ocean Engineering,

Key International and National Collaborators

- Prof. Mike Meylan, University of Newcastle, Australia
- Prof. D. Q. Lu, Shanghai University China
- Prof. Libin Rong, University of Florida, USA
- Prof. J. T. Kirby, University of Delaware, USA
- Prof. T. Tsai, National Ocean University, Taiwan
- Prof. T. Sahoo, IIT Kharagpur
- Prof. S. R. Manam, IIT Madras
- Prof. S. N. Bora, IIT Guwahati
- Prof. S. C. Martha, IIT Roopar
- Dr. R. Behera, IISC Bangalore

Funded Projects

- Establishment of Advanced Computing Research Lab, March-2023- Feb-2028, DST-FIST grant, Grant amount-Rs. 271,00,000(COPI, played the lead role)
- Time-dependent wave packet effect on very large floating structure, DST-CRG, SERB, CRG/2021/002821, Feb-2021 to May-2025, Grant amount- Rs, 21,08,000(PI)
- Analytical, Numerical and Experimental study of Glioblastoma, VIT Seed Grant, VIT SG20220069, March-2022 to Feb-2024, Grant amount- Rs, 2,50,000(PI)
- Integration of Breakwater and Wave Energy Devices in the Presence of Current, VIT International Grant, VIT Vellore, March-2024 to Feb-2026, VIN/2023-24/023, Grant amount Rs 4,00,000(PI)

Ph.D. Supervision

- **M. Muniyappan**, *Time and Frequency Domain Problems in the Presence of Current*, Ph.D. awarded March 2025; Assistant Professor, VIT Bhopal, from July 2026.
- **Rajesh Ranjan Dora**, *Wave Scattering and Trapping in the Presence of Current*, Ph.D. awarded June 2025; now Research Associate, IIT Madras.
- **Salman Mohammed**, *Mathematical Modeling and Deep Learning for Brain Tumor Prognosis and Diagnosis*, Awarded June 2026, Assistant Professor, Dayananda Sagar University, Bangalore.
- **Gulzar Ali**, *Photonic Space and Time Crystal*, submitted March 2026 (Co-supervisor: Dr. Chittaranjan Nayak).
- **Bahadur Yadav**, *Deep Learning for Portfolio Management*, ongoing.
- **Riya Gupta**, *Explainable Artificial intelligence for portfolio management*, ongoing.

List of Most Significant Publications

1. Yadav, Bahadur; **Mohanty, Sanjay Kumar*** (2026). Hybrid Ridgelet Deep Neural Networks for Data-Driven Arbitrage Strategies. *Proceedings of the Royal Society A: Mathematical, Physical and Engineering Sciences*, Vol. 482(2341), Article 20251054. Royal Society Publishing.
2. Ali, Gulzar; **Mohanty, Sanjay Kumar**; Nayak, Chittaranjan (2025). "Mode Sensitive Topological Interface State Dual-Mode Absorber in Hyperbolic Metamaterials Based One-

Dimensional Photonic Crystals with Graphene and Gold Layer.” *IEEE Transactions on Nanotechnology*, Vol. 25, pp. 138. IEEE.

3. Dora, Rajesh Ranjan; Meylan, Mike; **Mohanty, Sanjay Kumar*** (2025). “Analysis of a Moored Floating Piezoelectric WEC in the Presence of a Wall.” *European Journal of Mechanics B/Fluids*, Vol. 115, pp. 204390. Elsevier.
4. Salman, Mohammed; Das, Pradeep Kumar; **Mohanty, Sanjay Kumar*** (2024). “A Systematic Review on Recent Advancements in Deep Learning and Mathematical Modelling for Efficient Detection of Glioblastoma.” *IEEE Transactions on Instrumentation and Measurement*, Vol. 73, pp. 2533134. IEEE.
5. Dora, Rajesh Ranjan; Trivedi, Kshma; **Mohanty, Sanjay Kumar***; Koley, Santanu (2024). “Oblique wave scattering by porous structures in the presence of current.” *Engineering Analysis with Boundary Elements*, Vol. 167, pp. 105885. Elsevier.
6. Dora, Rajesh; Saha, Sunanda; Lu, D.Q.; **Mohanty, Sanjay Kumar*** (2023). “Wave resonances and hydroelastic wave motion.” *Proceedings of the Royal Society A*, Vol. 479, No. 2272, pp. 20230105. The Royal Society of London.
7. Muniyappan, M.; Dora, Rajesh Ranjan; **Mohanty, Sanjay Kumar*** (2023). “Wave resonances in the presence of current and the frequency and time-domain interconnection.” *Wave Motion*, Vol. 119, pp. 103128. Elsevier.
8. Saha, Sunanda; **Mohanty, Sanjay Kumar***; Bora, Swaroop Nandan (2022). “Flexural gravity wave resonance in the presence of current.” *Journal of Waterway, Port, Coastal, and Ocean Engineering*, Vol. 148, No. 3, pp. 04022003. American Society of Civil Engineers.
9. **Mohanty, Sanjay Kumar*** (2021). “Time-dependent wave motion with undulated bottom.” *Acta Mechanica*, Vol. 232, No. 1, pp. 283–303. Springer.
10. Mondal, Ramnarayan; **Mohanty, Sanjay Kumar**; Sahoo, Trilochan (2013). “Expansion formulae for wave structure interaction problems in three dimensions.” *The IMA Journal of Applied Mathematics*, Vol. 78, No. 2, pp. 181–205. Oxford University Press.

List of All Publications

2026

- Yadav, Bahadur; **Mohanty, Sanjay Kumar*** (2026). Hybrid Ridgelet Deep Neural Networks for Data-Driven Arbitrage Strategies. *Proceedings of the Royal Society A: Mathematical, Physical and Engineering Sciences*, Vol. 482(2341), Article 20251054. Royal Society Publishing.
- Gulzar, A. J., **Mohanty, Sanjay Kumar**, Nayak, C., Mohankumar, N., & Swain, S. K. (2026). *Polarization-Sensitive Absorption in All-Hyperbolic-Metamaterial Photonic Crystal Heterostructures Containing Graphene Layers*. *Physics Letters A*, Article 132002. Elsevier.

2025

- Dora, Rajesh Ranjan; Meylan, Mike; **Mohanty, Sanjay Kumar*** (2026). “Analysis of a Moored Floating Piezoelectric WEC in the Presence of a Wall.” *European Journal of Mechanics B/Fluids*, Vol. 116, Article 204390. Elsevier.

- Ali, Gulzar; **Mohanty, Sanjay Kumar***; Nayak, Chittaranjan (2025). "Magnetically Tunable Angle-Insensitive Multimode Absorption in Graphene Embedded Topological Photonic Heterostructures." *Physica B: Condensed Matter*, Vol. 707, Article 417157. Elsevier.
- Salman, Mohammed; **Mohanty, Sanjay Kumar*** (2025). "Data-Driven Neural Differential Equation Model and Stochastic Dynamics for Glioma Prediction." *IEEE Access*, Vol. 13, pp. 145211–145222, August 2025. IEEE.
- Ali, Gulzar; **Mohanty, Sanjay Kumar***; Nayak, Chittaranjan (2025). "Dual-Band Angle-Independent Terahertz Absorption via Coupled Modes in Hyperbolic-Metamaterial-Based Photonic Crystals Integrating Graphene and Gold Layers." *physica status solidi (RRL) – Rapid Research Letters*, 2025.
- Ali, Gulzar; **Mohanty, Sanjay Kumar***; Nayak, Chittaranjan (2025). "Mode Sensitive Topological Interface State Dual-Mode Absorber in Hyperbolic Metamaterials Based One-Dimensional Photonic Crystals with Graphene and Gold Layer." *IEEE Transactions on Nanotechnology*, Vol. 25, Article 138. IEEE.
- Aggarwal, Akshita; **Mohanty, Sanjay Kumar***; Martha, S.C. (2025). "Bragg Resonance in a Two-Layer Fluid with the Inclusion of Current and Tension at Both Surface and Interface." *Archive of Applied Mechanics*, Vol. 95, pp. 26. Springer Nature.

2024

- Khuntia, Sagarika; Mohapatra, Smrutiranjana; **Mohanty, Sanjay Kumar** (2024). "Bragg scattering by an irregular, versatile seabed in the presence of current." *Journal of Fluids and Structures*, Vol. 125, pp. 104059. Elsevier.
- Dora, Rajesh Ranjan; Mondal, Ramnarayan; **Mohanty, Sanjay Kumar** (2024). "Wave trapping by porous breakwater near a wall under the influence of ocean current." *Ocean Engineering*, Vol. 303, pp. 117820. Elsevier.
- Dora, Rajesh Ranjan; Trivedi, Kshma; **Mohanty, Sanjay Kumar**; Koley, Santanu (2024). "Oblique wave scattering by porous structures in the presence of current." *Engineering Analysis with Boundary Elements*, Vol. 167, pp. 105885. Elsevier.
- Dora, Rajesh Ranjan; **Mohanty, Sanjay Kumar** (2024). "Bragg resonance due to an undulated elastic bottom in the presence of current." *The European Physical Journal Special Topics*, pp. 1–10. Springer.
- Salman, Mohammed; Das, Pradeep Kumar; **Mohanty, Sanjay Kumar** (2024). "A Systematic Review on Recent Advancements in Deep Learning and Mathematical Modelling for Efficient Detection of Glioblastoma." *IEEE Transactions on Instrumentation and Measurement*, Vol. 73, pp. 2533134. IEEE.
- Dora, Rajesh Ranjan; Manam, Srinivasa Rao; **Mohanty, Sanjay Kumar** (2024). "Wave resonances and the time-dependent capillary gravity wave motion." *Wave Motion*, Vol. 131, pp. 103412. Elsevier.

2023

- Muniyappan, M.; Dora, Rajesh Ranjan; **Mohanty, Sanjay Kumar** (2023). "Wave resonances in the presence of current and the frequency and time-domain interconnection." *Wave Motion*, Vol. 119, pp. 103128. Elsevier.
- Dora, R.; Saha, S.; Lu, D.Q.; **Mohanty, S.K.** (2023). "Wave resonances and hydroelastic wave motion." *Proceedings of the Royal Society A*, Vol. 479, No. 2272, pp. 20230105. The Royal Society of London.
- Muniyappan, M.; **Mohanty, Sanjay Kumar** (2023). "The role of blocking dynamics and current on wave scattering due to finite floating elastic plate." *Ocean Engineering*, Vol. 282, pp. 114985. Elsevier.

2022

- Saha, Sunanda; **Mohanty, Sanjay Kumar**; Bora, Swaroop Nandan (2022). "Flexural gravity wave resonance in the presence of current." *Journal of Waterway, Port, Coastal, and Ocean Engineering*, Vol. 148, No. 3, pp. 04022003. ASCE.

2021

- Mohanty, S. K. (2021). *Time-dependent wave motion with undulated bottom*. *Acta Mechanica*, **232**(1), 283–303. Springer.

2020

- Mohanty, S. K., & Sidharth, M. (2020). *Time dependent wave motion in a permeable bed*. *Meccanica*, **55**(7), 1481–1497. Springer.

2019

- Mohanty, S. K. (2019). *Transient flexural gravity waves in two-layer fluid*. *Meccanica*, **54**(3), 491–504. Springer.
- Mohanty, S. K. (2019). *Transient axi-symmetric disturbances in two-layer fluid*. *International Journal of Applied and Computational Mathematics*, **5**(5), Article 125. Springer.

2015

- Mohanty, S. K., Bhattacharjee, J., & Sahoo, T. (2015). *Time-dependent capillary-gravity waves in the presence of current*. *Acta Mechanica*, **226**(2), 311–330. Springer.

2014

- Mohanty, S. K., Mondal, R., & Sahoo, T. (2014). *Time dependent flexural gravity waves in the presence of current*. *Journal of Fluids and Structures*, **45**, 28–49. Elsevier.

2013

- Mondal, R., Mohanty, S. K., & Sahoo, T. (2013). *Expansion formulae for wave structure interaction problems in three dimensions*. *IMA Journal of Applied Mathematics*, **78**(2), 181–205. Oxford University Press.