Sanjay Kumar Sahoo, Ph.D.

DESIGNATION : ASSISTANT PROFESSOR

DEPARTMENT: DEPARTMENT OF BASIC SCIENCES AND HUMANITIES (JOINED THE INSTITUTE IN YEAR 2024)

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RESEARCH INTERESTS

- ✓ HIGHER-ORDER COMPUTATIONAL TECHNIQUES TO SOLVE SINGULARLY PERTURBED DIFFERENTIAL EQUATIONS AND DIFFERENTIAL-DIFFERENCE EQUATIONS TWO PARAMETER PROBLEMS, FRACTIONAL-ORDER (BOTH SPACE AND TIME) IN ONE DIMENSIONAL AND MULTI-DIMENSIONAL PROBLEM.
- ✓ COMPUTATIONAL APPROXIMATIONS: EXPONENTIAL SPLINE, TRIGONOMETRIC SPLINE, ORTHOGONAL SPLINE COLLOCATION METHOD FINITE DIFFERENCE METHODS AND FINITE ELEMENT METHODS.
- ✓ LAYER ADAPTED MESH GENERATION TECHNIQUES
- ✓ ROBUST COMPUTATIONAL TECHNIQUES FOR SINGULARLY PERTURBED PROBLEM WITH POWER TYPE LAYERS AND HYBRID LAYERS.
- ✓ NEURAL NETWORK BASED NUMERICAL APPROACH TO SOLVE PARTIAL DIFFERENTIAL EQUATIONS OF INTEGER AND FRACTIONAL ORDER.

Academic Qualifications

Post-Doctorate: The LNMIIT, Jaipur, Rajasthan
PH.D.(Computational Mathematics): The LNMIIT (2023)
M.Tech (CS): Utkal University
M.Sc (Mathematics): Utkal University

TEACHING/INDUSTRIAL/RESEARCH EXPERIENCE

Teaching Assistant in the Department of Mathematics at The LNMIIT, Jaipur from August, 2016 — May, 2022, taught the following courses: Calculus and Real Analysis, Linear Algebra and ODE, Complex Analysis and PDE.publications

JOURNAL ARTICLES & CONFERENCE PAPERS

[1]. **Sahoo, Sanjay Ku, Gupta, Vikas, and Dubey Shruti** "A Robust Higher-Order Finite Difference Technique for a Time-Fractional Singularly Perturbed Problem", Mathematics and Computers in Simulation, 215, (2024), 43-68. https://doi.org/10.1016/j.matcom.2023.08.013 (SCI/SCOPUS/WoS-Q1, IF-4.6)

[2]. **Sahoo, Sanjay Ku and Gupta, Vikas,** "Parameter Robust Higher-Order Finite Difference Method for Convection-Diffusion Problem with Time Delay", Numerical Methods for Partial Differential Equations, 39 (6) (2023), 4145-4173. https://doi.org/10.1002/num.23039 (SCI/SCOPUS/WoS-Q1, IF-3.9)

[3]. **Sahoo, Sanjay Ku and Gupta, Vikas,** "Higher-Order Robust Computational Technique for Singularly Perturbed Problem with an Interior Turning Point", Mathematics and Computers in Simulation, 211 2023, 192-213. https://doi.org/10.1016/j.matcom.2023.04.012 (SCI/SCOPUS/WoS-Q1, IF-4.6)

[4]. **Sahoo, Sanjay Ku and Gupta, Vikas,** "Robust Computational Technique for Fractional Time Singularly Perturbed Convection-Diffusion Problem", Computers and Mathematics with Applications, 137 (2023), 126-146. (SCI/SCOPUS/WoS-Q1, IF-3.218) https://doi.org/10.1016/j.camwa.2023.02.016

[5]. **Sahoo, Sanjay Ku and Gupta, Vikas,** "Higher Order Robust Numerical Computation for Singularly Perturbed Problem Involving Discontinuous Convective and Source Term", Mathematical Methods in the Applied Sciences, 45 (8) (2022), 4876–4898, https://doi.org/10.1002/mma.8077 (SCIE/SCOPUS/WoS-Q1, IF-3.007)

[6]. **Gupta, Vikas and Sahoo, Sanjay K and Dubey, Ritesh K,** "Robust Higher Order Finite Difference Scheme for Singularly Perturbed Turning Point Problem with two Outflow Boundary Layers", Computational and Applied Mathematics, 40 (5) (2021), 1–23. https://doi.org/10.1007/s40314-021-01564-w (SCIE/WoS-Q1, IF-2.872)

[7]. **Ku Sahoo, Sanjay and Gupta, Vikas,** "Second-Order Parameter-Uniform Finite Difference Scheme for Singularly Perturbed Parabolic Problem with a Boundary Turning Point", Journal of Difference Equations and Applications, 27 (2) (2021), 223–240, https://doi.org/10.1080/10236198.2021.1887157 (SCIE-Q3/WoS/SCOPUS-Q1, IF=1.352).

ANY OTHER

INVITED TALKS

✓ Indian Institute of Information Technology, Mandi, (IIT, Mandi) Himanchal Pradesh "Second-Order Parameter Uniform Numerical Computation for Singularly Perturbed Boundary Turning Point Problem having Power-Type Layers" with Vikas Gupta & Vladmir D. Liseikin, presented in International Conference on Differential Equations and Control Problems (ICDECP 2023), June, 15-17 2023.

CONFERENCE PAPER PRESENTED:

1. "Higher-Order Hybrid Finite Difference Scheme for Singularly Perturbed Problem with interior Layer" International Conference on Mathematical Analysis and Applications & 50th Annual Conference of Odisha Mathematical Society (OMS), January, 21-22, 2023, Institute of Mathematics and Applications, Bhubaneswar, Odisha.
2. "A Robust Uniformly Convergent Finite Difference Scheme for the Time-Fractional Singularly Perturbed Convection-Diffusion Problem", 5th International Conference on Mathematical Modelling, Applied Analysis And Computation (ICMMAAC-22), August, 04-06, 2022, JECRC University, Rajasthan.
3. "Robust Higher-Order Numerical Scheme for Time Dependent Singularly Perturbed Differential-Difference Convection-Diffusion quation", International Conference on Computational Mathematics and Engineering Applications, June, 24-26, 2022, PSIT, Kanpur, Uttar Pradesh.
4. "Parameter Uniform Numerical Method for Singularly Perturbed Convection-Diffusion Problem with a Delay in Time", International Conference on Advances Trends in Computational Mathematics, Statistics and Operation Research, April, 02-03, 2022, The Northcap University, Gurgaon, Haryana.
5. "Higher-Order Difference Scheme for Singularly Perturbed Parabolic Problem with a Boundary Turning Point", 31st Annual Conference of Rajasthan Ganita Parishad on Recent Trends of Mathematics in Science and Engineering (ACRPRTMSE-2021), March, 13-14, 2021, The LNMIIT (Deemed to be University), Jaipur, Rajasthan.
6. "Higher-Order Difference Scheme for Parabolic Singularly Perturbed Problem with Time Delay ", International Conference on dvances in Differential Equations and Numerical Analysis (ICADENA-2020), October, 12-15, 2020, Indian Institute of Technology, Guwahati, India.
7. "Second Order Computational Technique for Singularly Perturbed Problem having Discontinuous Convection and Source Term", with Vikas Gupta, presented in International Conference on Computational Sciences Modeling, Computing and Soft Computing (ICCSSMCSC-2020),September, 10-12, 2020, National Institute of Technology, Calicut, Kerala.
8. "Higher-Order Hybrid Finite Difference Scheme for Singularly Perturbed Problem with an Interior Turning Point", National Seminar on Mathematical Analysis and Computing & 47th Annual Conference of Odisha Mathematical Society, February, 15-16, 2020, National Institute of Science & Technology, Berhampur, Odisha.
9. "Second Order Parameter-Uniform Finite Difference Scheme for Singularly Perturbed Parabolic Problem with a Boundary Turning Point", 4th International Conference on Recent Developments in Theory, Computation & Applications January, 21-23, 2019, South Asian University, New Delhi, India.

MEMBER:

Life Member of Odisha Mathematical Society.