Faculty Profile

Dr. R. Rajaraman , M.Sc., M.Phil., B.Ed., Ph.D
Professor – Mathematics (S&H)

HIGHLIGHTS:

- Number of Journal Publications:35
- h-index:8
- i10-index 6
- Citations: 192
- Impact Factor: 28.782

PROFESSIONAL LINKS:

- Scopus ID: ID:55332072800
- Scopus Link: https://www.scopus.com/authid/detail.uri?authorId=55332072800
- Google Scholar ID: https://scholar.google.co.in/citations?user=zErcHMUAAAAJ&hl=en
- Anna University Faculty ID: 271012
- AICTE Faculty ID:1-11018054964
- **Recognized Ph.D supervisor under Anna University (Ref No: 4170053). Open to guiding research scholars in Mathematics.**
- LinkedIn: (https://www.linkedin.com/in/dr-r-rajaraman-39072317a/)

PROFESSIONAL BACKGROUND:

- Teaching Experience till date: 27 years
- Research Experience till date: 13 years

AREA OF SPECIALIZATION:

- Nonlinear and fractional differential equations
- Mathematical modelling
- Wavelet methods.

- Semi analytical methods

SPECIAL SESSIONS DELIVERED:

- Delivered a speech as a session speaker at the 13th International Conference on Recent Challenges in Engineering and Technology (ICRCET-24) held in Chennai, India on September 27–28, 2024 organized by IFERP Academy, India Academic Partner: St.Joseph's College of Engineering, Chennai
- Delivered a speech during the Skill Development Session organized by Mastering UP, an esteemed online learning platform, in collaboration with TEMS Tech Solutions, on November 20, 2024.

JOURNAL PUBLICATIONS:

- Graph-based analysis of large-amplitude ship rolling in rough seas, Ships and Offshore structures (Taylor & Francis) (2025) (SCI & SCOPUS indexed, IF 1.8), https://doi.org/10.1080/17445302.2025.2537935.

- Nonlinear and Fractional Van der Pol Oscillators in Cardiac Rhythm Modelling: A Wavelet-Based Approach, Engineering Computations (Emerald Insight) (2025). (SCI & SCOPUS indexed, IF 1.5).

- Modeling Immobilized Enzyme Reactions: Nonlinear Kinetics With Fractional- and Integer-Order Analysis, Mathematical Methods in the Applied Sciences (Wiley) (2025). (SCI & SCOPUS indexed, IF 1.8) https://doi.org/10.1002/mma.10791.

- Advanced approximation techniques for fractional Van der Pol oscillators using Lucas wavelets, Book: Recent Innovations in Science and Humanities, CRC press (Taylor & Francis) (2025) (SCOPUS indexed), eBook ISBN: 9781003606611

- Exploring Nonlinear Reaction–Diffusion in Enzyme Immobilized Systems: Integer and Fractional Order Modeling, Applied Biochemistry and Biotechnology (Springer) (2025). (SCI & SCOPUS indexed, IF:3.1) https://doi.org/10.1007/s12010-024-05050-x.

- Beyond conventional models: integer and fractional order analysis of nonlinear Michaelis-Menten kinetics in immobilised enzyme reactors. Engineering Computations (Emerald Insight) (2024). (SCI & SCOPUS indexed, IF 1.5). https://doi.org/10.1108/EC-03-2024-0238

- Wavelet-based mathematical analysis of immobilized enzymes in porous catalysts under nonlinear Michaelis-Menton kinetics, Journal of Mathematical chemistry (2024). (SCI & SCOPUS Indexed, IF: 2.413) https://doi.org/10.1007/s10910-023-01548-7.

- An efficient wavelet algorithm for the fractional view analysis of Bagley-Torvik equation, International Journal of Applied Mathematics (2024) (SCOPUS)

- Estimation of roll damping parameters using Hermite wavelets: An operational matrix of derivative approach, Ocean Engineering (Elsevier) (2023) (SCI & SCOPUS Indexed, IF: 4.372) https://doi.org/10.1016/j.oceaneng.2023.115031

- A New Wavelet Collocation Algorithm for Solving a Nonlinear Boundary Value Problem of the Human Corneal Shape, Nonlinear Dynamics, Psychology, and Life Sciences, Vol. 27, No. 4, pp. 381-395. © (2023) Society for Chaos Theory in Psychology & Life Sciences (Scopus & Web of Science)

- Bernoulli wavelets computational algorithms for the nonlinear dynamical systems: Technical note, International Journal of Vehicle Structures and Systems (2024) 16(4), 491-493 (Scopus indexed) doi: 10.4273/ijvss.16.4.02

- Learning a wavelet-based advanced technique for the reaction-diffusion equations arising in biofiltration, TWMS JAEM 2023- (Scopus).

- Application of a wavelet collocation method for a nonlinear boundary value problem related to Michaelis-Menton uptake kinetics, TWMS JAEM 2023- (Scopus).

- An efficient wavelet based spectral method to singular boundary value problems, J. Math. Chem., 53 (2015) 2095-2113 (SCI & SCOPUS Indexed, IF: 2.413). DOI 10.1007/s10910-015-0536-0

- An efficient wavelet-based approximation method to gene propagation model arising in population biology, J. Membrane Biol., 247 (2014) 561-570. (SCI & SCOPUS Indexed, IF: 2.426). DOI 10.1007/s00232-014-9672-x

- A new coupled wavelet-based method applied to the nonlinear reaction-diffusion equation arising in mathematical chemistry, J.Math.Chem. 51(2013) 2386-2400. (SCI & SCOPUS Indexed, IF: 2.413) DOI 10.1007/s10910-013-0217-9

- Two reliable wavelet methods to Fitzhugh-Nagumo (FN) and fractional FN equations, J.Math.Chem., 51(2013) 2432-2454. (SCI & SCOPUS Indexed, IF: 2.413). DOI 10.1007/s10910-013-0220-1

- Wavelet based spectral algorithm for nonlinear dynamical systems arising in ship dynamics, Ocean Engineering, 126 (1) (2016) 321–328. (Elsevier, SCI & SCOPUS Indexed, I.F: 4.372). http://dx.doi.org/10.1016/j.oceaneng.2016.09.022.

- Comparative Analysis of Deep Learning Algorithms for Image Recognition in Medical Imaging, Second International Conference on Advances in Information Technology (ICAIT-2024) (IEEE Proceedings-Scopus)
  DOI: 10.1109/ICAIT61638.2024.10690528

- Liao's method for a few space and time fractional reaction-diffusion equations arising in Engineering, IJET 5(3) (2013) 3077-3091. (Scopus).

- An efficient analytical algorithm for wave-type and time fractional PDEs, World Applied Sciences Journal, 23(12) (2013) 15-22. (Scopus).

- Approximate analytical solutions of two dimensional transient heat conduction equations, Applied Mathematical Sciences, 6(71) (2012) 3507-3518. (Scopus).

- A new wavelet-based hybrid method for Fisher type equations, Fractals, Wavelets and their Applications, conference paper Springer proceedings in Mathematics and Statistics 92 (2014) 501-508. (Scopus).

- An efficient hybrid analytical approach to film pore diffusion model, International Journal of Mechanical and Production Engineering Research and Development (IJMPERD), 7(6) (2017) 365-376. (Scopus).

- An efficient computational algorithm for the problems arising in nonlinear dynamical systems, Materials Today: Proceedings, https://doi.org/10.1016/j.matpr.2020.08.398, September 2020 (Scopus).

- A new and efficient wavelet algorithm for the fractional Van der Pol oscillator, Solid State Technology, September 2020. (Scopus).

- A new and efficient wavelet algorithm for nitric oxide removal in a biotrickling filter, Solid State Technology, September 2020. (Scopus).

- Wavelet method for a class of space and time fractional telegraph equations, International Journal of Physical Sciences, 7(10) (2012) 1591-1598.

- Haar wavelets approach of travelling wave equation-A plausible solution of lightning stroke model, International Journal of Engineering and Technology,2(2) (2013) 149-156.

- Homotopy Perturbation Transform method for solving Klein-Gordan equations, IJETTCS, 1(4) (2012) 150-154.

- Solving helmholtz equation by Homotopy perturbation transform method, International journal of Mathematics and Computer Applications Research, September 2012.

- Analytical solutions for the different forms of telegraph equations by Homotopy analysis method, Global journal of science frontier research mathematics and decision sciences, May 2012.

- Analytical solutions for some of the nonlinear hyperbolic equations with variable coefficients, Global journal of science frontier research mathematics and decision sciences, May 2012.

- Analytical solutions for Cauchy Reaction-diffusion equations, Asian Journal of Current Engineering & Maths, February 2013.

- A new analytical strategy based on a wavelet computing technique for solving Fokker-Plank equation arises in stochastic phenomena, published as a preprint in Research Square, 2023, DOI: https://doi.org/10.21203/rs.3.rs-2505421/v1.

CONFERENCES/SEMINARS/WORKSHOPS ATTENDED:

- International conferences on Number Theory in SRC-SASTRA Deemed University, Thanjavur (from December 2005 to December 2017) every year.

- IEEE-International conference on changing paradigms of technology and strategic management-ICPSM, August, 2013 in SASTRA and presented a paper titled 'Efficient wavelet based approximation method for Black-Scholes European option pricing equation'.

- ICFW-International conference on Wavelets and Fractals (ICFW-November 2013) in Rajagiri School of Engineering and Technology, Cochin, Kerala and presented a paper titled 'A new wavelet based hybrid method for Fisher type equation'(Springer Proceedings).

- NCAPDE-National conference on Advances in Partial differential equations (December 2013) in SRC-SASTRA.

- ICEE2K21-International Conference on Energy and Environment (2021), Syed Ammal Engineering College, Ramanathapuram and presented a paper titled 'An efficient

analytical wavelet method for a nonlinear reaction-diffusion equation related to Michaelis-Menton uptake kinetics'.

- ICMSA2022-International Conference on Mathematics and its Scientific Applications, Sathyabama Institute of Science and Technology, Chennai, in association with Universiti Teknologi MARA, Malaysia, conducted on 3rd & 4th March, 2022 and presented a paper titled 'A_Wavelet-Based Advanced Technique for Nonlinear Boundary Value Problems Arising in Biofiltration'.

- International conference on Advancements in Applicable Mathematics (ICAAM'22) organized by Department of Mathematics, S.I.V.E.T college Chennai on 7th March 2022.

- RDFCA-2022, National conference on recent developments in fractional calculus and its applications, SASTRA University, Thanjavur and presented a paper "An efficient wavelet algorithm for the fractional view analysis of Bagley-Torvik equation".

- ICWAGT-2022, International Conference on Wavelet Analysis and Graph Theory, SASTRA University, Thanjavur and presented a paper "Application of a wavelet collocation method for a nonlinear boundary value problem related to Michaelis-Menton uptake kinetics".

- ICISH (2023&2024), International Conference on Innovations in Science and Humanities, Saveetha Engineering College, Chennai and presented two papers on each year.

- One-day workshop in VIT Deemed University, Chennai on Differential equations and Transforms using MATLAB in 2013.

- Two days workshop in SASTRA Deemed University on 'Statistical tools and techniques in Management Research' in 2013.

- International workshop on Numerical and Analytical Techniques in Engineering Problems (IWNATEP-2022) organized by the Department of Mathematics held on January 19 - 21, 2022 at SRM Institute of Science and Technology, Kattankulathur, Tamil Nadu, India.

- One Week Faculty Development Programme on "Effective Teaching Learning Paradigms through Pedagogical Innovations" organized by the Department of Mathematics, Sathyabama Institute of Science and Technology, Chennai, from Feb 7 to Feb 12, 2022.

- Workshop on Python Programming held at the Department of Mathematics, University of Calicut, Malappuram, Kerala during 08-22 March 2022.

- International Faculty Development Programme (FDP) on Data Analytics and Machine Learning held during 21 - 25 March 2022 and jointly organized by Mizoram University and North-Eastern Hill University, India.

- Five Day National Online FDP on “Mathematical Modelling” organized by Department of Mathematics, Sarojini Naidu Vanita Maha Vidyalaya, Hyderabad from 6th April 2022 to 11th April 2022.

- FDP titled “Advanced Latex” conducted by Division of Mathematics, School of Advanced Sciences (SAS), during June 27-29, 2022 at Vellore Institute of Technology (VIT), Chennai.

- Two Week Online International Faculty Development Programme on "Current Trends in Applications of Mathematics" , organized by the Department of Mathematics, School of Sciences and Humanities, Vel Tech Rangarajan Dr.Sagunthala R&D Institute of Science and Technology, Avadi, Chennai-62, Tamil Nadu, India from 21- 09-2022 to 04-10-2022.

- International Faculty Development Programme on Mathematical Modelling of Biosystems with Special Focus on Epidemiology held at Mizoram University during 22 - 27 August, 2022

- Two-Day Online National Workshop on “Mathematical Tools – MATLAB & Mathematica” organized by the Division of Mathematics, School of Advanced Sciences, Vellore Institute of Technology, Chennai on 30th and 31st January 2023.

PROFESSIONAL MEMBERSHIPS:

- Ramanujan Mathematical Society

OTHER DETAILS (If any):

- Orcid ID: https://orcid.org/0000-0002-5810-7914

- ResearchGate URL
  https://www.researchgate.net/profile/R-Rajaraman-3

- Ocean Expert Profile URL
  https://oceanexpert.org/expert/rajaramanr@saveetha.ac.in

- **Peer-Reviewing Activities For Academic Journals:**
  - Review activity for Journal of Vibration Engineering and Technologies (Springer) (4 times)
  - Review activity for Engineering Computations journal (Emerald Insight). (4 times)
  - Review activity for Journal of Computational Biophysics and Chemistry (World Scientific). (3 times)
  - Review activity for Neural Computing & Applications (Springer). (11 times)
  - Review activity for Ocean Engineering (Elsevier). (5 times)
  - Review activity for Ain Shams Engineering Journal (Elsevier). (3 times)
  - Review activity for Iranian Journal of Science and Technology Transactions A (Springer). (2 times)
  - Review activity for Physical and Engineering Sciences in Medicine (Springer) (1 time)
  - Review activity for International Journal of Educational Spectrum (DergiPark) (3 times)
  - Review activity for International Journal of Electrochemical Science (Science Direct). (3 times)
  - International Journal of Mathematics and Mathematical Sciences (Wiley) (2 times)

  - Review activity for ships and Offshore Structures (Taylor & Francis). (3 times)
  - Review activity for Australasian physical & engineering sciences in medicine. (1).
  - Review activity for Automatika. (1 time).
  - Review activity for ChemCatChem (2 times).
  - Review activity for Nano letters. (1 time).
  - Review activity for Modern Chemistry (Science PG, USA) (2 times)

Editorial Board Member:

Modern Chemistry Journal, Science Publishing Group, USA.