


STANDARD TEMPLATE OF FACULTY PROFILE FOR UPLOADING OF UNIVERSITY WEBSITE

Title	Prof. (Dr.)	First Name	Rashmi	Last Name	Bhardwaj	
Designation		Fellow of Institute of Mathematics & Applications, UK Professor of Mathematics				
School /Dept. Name		University School of Basic & Applied Sciences				
Address:		Room No. B 504, Nonlinear Dynamics Research Lab, Guru Gobind Singh Indraprastha University, Sector 16C, Dwarka Delhi 110078				
Phone No.		Office	011-25302415			
		Residence	(optional) +91-9013534105			
		Mobile	(optional) +91-9868818880			
Email		1. rashmib@ipu.ac.in		2. rashmib22@gmail.com		
Web Page (if any)		http://ipu.ac.in/usbas/ProfRashmi.pdf				
Subjects Taught		Engineering Mathematics, Operational Research, Theory of Probability, Numerical Analysis, LPP, NLPP, Nonlinear Dynamic, Wavelet Analysis, Computational Physics, Matlab				
Areas of Interest/Specialization		Big data Analysis, Celestial Mechanics, Dynamical Astronomy, Nonlinear Dynamics, Applied & Computational Mathematics, Statistics, Wavelet – Fractal - Chaos, Complex Dynamics, Ordinary & Partial Differential Equations, Numerical Analysis, Fluid Dynamics & Optimization, Microfluidic - Nanofluidic, Atmospheric & Environmental Sciences, Fuzzy Mathematics, Optimization Techniques, Soft Computing - Data Sciences – Machine Learning; Integral Equations & Boundary Value Problem, Financial Mathematics				
Experience (in years)		Total	31			
		Industry				
		Teaching	26			
		Research	31			

Educational Qualifications	UG	B.Sc. (Hons.) Mathematics
	PG	M.Sc. Mathematics
	Doctorate	Ph.D. Mathematics
	Any other	
Research Publications in Journals (last 5 years)	<ol style="list-style-type: none"> 1. Bangia A. & Bhardwaj, R. (2022). Chaotic Simulation of Kinesiology of Musculoskeletal Movements. <i>Journal of Applied Nonlinear Dynamics</i>. 11(1). 233-245. 2. Bhardwaj, R. & Bangia, A. (2022). Wavelet-Neural-Fuzzy Coupled Modelling of National Stock Exchange (NSE) for Opening and Closing Stock. <i>Finance India</i>. (in press) 3. Das, S. & Bhardwaj, R. (2022). Analysis of Chaos Dynamics of Emotions in Employment Relation Model. <i>Italian Journal of Pure and Applied Mathematics</i>. (in press) 4. Das, S. & Bhardwaj, R. (2022). Dynamical modelling of Kaziranga wildlife ecology. <i>Italian Journal of Pure and Applied Mathematics</i>. (in press) 5. Duhoon V. & Bhardwaj, R. (2022). Canopy, Cobweb, DBSCAN clustering data mining techniques: Study and Analysis. <i>Italian Journal of Pure and Applied Mathematics</i>. (in press) 6. Bhardwaj, R. & Duhoon V. (2022). Weather forecasting based on hybrid wavelet-neural model. <i>Italian Journal of Pure and Applied Mathematics</i>. (in press) 7. Bhardwaj, R.; Bhardwaj, S. & Sajid, M. (2021): Fractal Analysis and Machine Learned Decision system for Precision and Smart Farming. <i>The European Physical Journal Special Topics</i>. s11734-021-00333-4 8. Bhardwaj, R. & Duhoon V. (2021). Hybrid modles for weather parameter forecasting. <i>Complexity</i>. Volume 2021, Article ID 6758557 9. Duhoon V. & Bhardwaj, R.. (2021). Verification of Ensembled Forecasting. <i>Journal of Climatology and weather forecasting</i> 9 (7) No. 297. 1-11. 10. Bhardwaj, R. & Duhoon V. (2021). Weather Forecasting using Decision Tree. <i>Journal of Engineering Research - ICCEMME Special Issue</i>. 1-14: 11. Das, S. & Bhardwaj, R. (2021): Time- Series Forecasting of Indian Rhinoceros poach at Kaziranga. <i>Pachyderm</i>, 62, 119-127 	

12. Das, S. & **Bhardwaj, R.** (2021): On Chaos and Multifractality in a Three-Species Food Chain System. *Malaysian journal of Mathematical Sciences*, 15(3): 457-475.
13. Bhardwaj S., Alowaidi M., **Bhardwaj R.** & Sharma S. (2021): Machine Learned Hybrid Gaussian Analysis of COVID-19 Pandemic in India. *Results in Physics*. 30: .104630.
14. Sharma S., Bangia A., Alshehri M. & **Bhardwaj, R.** (2021): Nonlinear Dynamics for spread of Pathogenesis of COVID-19 Pandemic. *Journal of Infection and Public Health*. 14(7), 817-831.
15. Das, S. & **Bhardwaj, R.** (2021): Recurrence analysis and synchronization of two resistively coupled duffing oscillators. *Nonlinear Dynamics*. 104(3), 2127-2144.
16. **Bhardwaj R.** & Bangia A. (2021). Neuronal Brownian Dynamics for Salinity of River Basins' Water Management. *Neural Computing and Applications*. 33: 11923-11936.
17. **Bhardwaj R.** & Bangia A.. (2021). Improvement in Long range prediction of Water quality using Wavelet based LSSVR and M5pRT. *Complexity*. Volume 2021, Article ID 6643472,
18. **Bhardwaj R.** & Bangia A. (2021) Dynamical Indicator of Human Body's Physical Endurance. *Nepal Journal of Mathematical Sciences*. 2(1), 25-35.
19. **Bhardwaj, R.** & Sajid M. (2021): Chaotic oscillation of Satellite due to Aerodynamic Torque. *Advances in Astronomy*. Volume 2021, Article ID 6658051.
20. **Bhardwaj, R.** & Bangia A.. (2021). Erratum: Fractal, Predictability Index and Variability in Trends Analysis of River Water Dynamics. *International Journal of River Basin Management*. 1-2.
21. Pruthi D. & **Bhardwaj R.** (2021): Modeling air quality index using optimized neuronal networks inspired by swarms. *Environmental Engineering Research*. 26(6), 200469.
22. Sharma S., Bhardwaj S., Alowaidi M. & **Bhardwaj R.** (2021): Nonlinear Time series analysis of Pathogenesis of COVID-19 Epidemiology Spread in Saudi Arabia. *Computers, Materials and Continua*. 66(1). 805-825.
23. **Bhardwaj, Rashmi** & Das, S. (2020). Synchronization of two three-species food chain system with Beddington- DeAngelis functional response using active controllers based on the Lyapunov function. *Italian Journal of Pure and Applied Mathematics*. 44. 57-77.
24. **Bhardwaj R.** & Parmar K. S. (2020). Correction to: Statistical, time series and fractal analysis of full stretch of river Yamuna

(India) for water quality management. *Environmental Science and Pollution Research*. 27: 42189–42191.

25. Muhammad S., **Bhardwaj R.** & Datta D. (2020). Application of Intelligent Computing to Develop Performance Index Algorithm as a Multicriteria Decision Making Tool. *International Journal of Intelligent Networks*. 1. 85-91.
26. Saha L M & **Bhardwaj R.** (2020). Complex Structure in Modified Hènon Map and its Dynamic Evolution. *Indian Journal of Industrial and Applied Mathematics*. 11(1). 31-41.
27. **Bhardwaj R.** & Duhoon V. (2020). Dispersion analysis of monthly rainfall & temperature time series – 1901-2015. *Indian Journal of Industrial and Applied Mathematics*. 11(1). 91-100.
28. **Bhardwaj R.**, Chawla, M., Das S., Bangia A. & Goncerzewicz J. (2020). Effect of magnetic and temperature variation on Al₂O₃ nanofluid Convection. *Mathematica Applicanda*. 48(1), 3-23.
29. **Bhardwaj R.** & Duhoon V. (2020). Applications of Blockchain to fight against COVID-19. *International Journal of Communication Systems and Network Technologies* 9(1). 16-23.
30. **Bhardwaj R.** & Bangia, A. (2020). Data Driven Estimation of Novel COVID-19 Transmission Risks through Hybrid Soft-Computing Techniques. *Chaos, Soliton and Fractals*. 140; 110152
31. **Bhardwaj R.** & Duhoon V. (2020): Time Series Analysis of Rainfall Using Heteroskedasticity Models *Jñānābha*. 50(1). 243-252.
32. **Bhardwaj R.** & Datta, D. (2020): Optimization Techniques. *Revista INGLOMAYOR Ingeniera Global Mayor*. 18 (A); 54-82
33. **Bhardwaj R.** & Duhoon, V. (2020). Auto-Regressive Integrated Moving-Averages Model for Daily Rainfall Forecasting. *International Journal of Scientific and Technology Research*. 9(2), 793-797.
34. **Bhardwaj R.** & Pruthi, D. (2020). Evolutionary Techniques for Optimizing Air Quality Model. *Procedia Computer Science*. 167C: 1872-1879.
35. **Bhardwaj R.** & Pruthi, D.. (2020). Development of Model for Sustainable Nitrogen Dioxide Prediction Using Neuronal Networks. *International Journal of Environmental Science and Technology*. 17, 2783-2792.
36. **Bhardwaj R.** & Das, S. (2019): Synchronization of Chaotic Food Chain with Competitive Species. *Bulletin of Calcutta Mathematical Society* 111(1). 53-64.
37. **Bhardwaj R.** & Duhoon, V. (2019): Time Series Analysis of Heat Stroke. *Jñānābha*. 49(1). 01-10.

38. **Bhardwaj R.** (2019): Does Vedic Mathematics is from Vedics? *Revista INGLOMAYOR Ingenierna Global Mayor*. 17(A); 306-315.
39. **Bhardwaj R.** (2019): Equity Questions in Science, Technology and Entrepreneur through Gender Lenses. *Revista INGLOMAYOR Ingenierna Global Mayor*. 16(B). 13-17.
40. Saha, L. M.; **Bhardwaj R.** & Das, M. K (2019). On Ecosystem Models, Chaos and complexity. *Indian Journal of Industrial and Applied Mathematics*. 10(1). 118-124.
41. **Bhardwaj R.** & Kaur, M. (2019). Chaos in Non-linear planar oscillation of a Satellite in an Elliptic Orbit under the Influence of Aerodynamic Torque. *Indian Journal of Industrial and Applied Mathematics*. 10(1). 76-90.
42. **Bhardwaj R.** & Pruthi, D. (2019): Variability analysis in PM2.5 monitoring. *Data in Brief*. 24,103774.
43. **Bhardwaj R.** & Pruthi, D. (2019). Transient Weather Impact on Air Pollution. *Indian Journal of Industrial and Applied Mathematics*. 10(2). 139:151.
44. **Bhardwaj R.** & Bangia, A. (2019). Dynamic Indicator for the prediction of Atmospheric Pollutants. *Asian Journal of Water, Environment and Pollution*. 16(4). 39-50.
45. **Bhardwaj R.** & Das, S. (2019). Chaos Control Dynamics in Competitive Herbivore Species Network. *Jñānābha*. 49(2). 22-28.
46. **Bhardwaj R.** & Pruthi, D. (2019). Air Quality Prediction using Time Space Analysis. *Jñānābha*. 49(2). 6-14.
47. **Bhardwaj R.** & Duhoon, V. (2019). Real Time Prediction of Temperature using ANFIS-SUGENO Model. *International Journal of Engineering and Advanced Technology*. 9(1). 461-469.
48. **Bhardwaj R.** & Bangia, A. (2019). Hybrid Fuzzified-PID controller for non-linear control surfaces for DC motor to improve the efficiency of electric battery driven vehicles. *International Journal of Recent Technology and Engineering*. 8(3). 2561-2568.
49. **Bhardwaj R.** & Das, S. (2019). Recurrence quantification analysis of a three-level trophic chain model. *Heliyon*. 5(8). e02182.
50. **Bhardwaj R.** & Das, S. (2019): Chaos dynamics of emotions in marital relation model. *Bulletin of Calcutta Mathematical Society* 111(6). 559-576.
51. **Bhardwaj R.** & Bangia, A. (2018). Stock Market trend analysis during Demonetization using Soft-Computing techniques. *IEEE Xplore Digital Library*. 978-1-5386-4491-1/18, 696-701.

52. **Bhardwaj R.** & Duhoon, V. (2018). Weather Forecasting Using Soft Computing Technique. *IEEE Xplore Digital Library*. 978-1-5386-4491-1/18, 1111-1115.
53. **Bhardwaj R.** & Bangia, A. (2018). Statistical Time Series Analysis for Dynamics of HIV. *Jñānābha*. 48(s). 22-27.
54. **Bhardwaj R.** & Pruthi, D. (2018). Statistical Time Series and Predictability Analysis of Nitrogen Dioxide. *Jñānābha*. 48(s). 5-12.
55. **Bhardwaj R.** & Das, S. (2018). Fractal Analysis of Indian Rhinoceros poaching at Kaziranga. *Jñānābha*. 48(s). 54-60.
56. **Bhardwaj R.** & Chawla, M. (2018). Convection Dynamics of Fe₃O₄ nanoparticles in Blood Fluid Flow. *Indian Journal of Industrial and Applied Mathematics*. 9(1). 23-36.
57. **Bhardwaj R.** & Kaur, Manjeet. (2018). Synchronization of Satellite motion under the Influence of Aerodynamic Torque. *Indian Journal of Industrial and Applied Mathematics*. 9(1). 82-95.
58. **Bhardwaj R.** & Kaur, M. (2018). Aerodynamic Torque Exhibits Resonance in Satellite Motion. *Indian Journal of Industrial and Applied Mathematics*. 9(2). 107-119.
59. Saha, L.M.; Das, M. K. & **Bhardwaj R.** (2018). Asymptotic Stability Analysis Applied to Price Dynamics. *Indian Journal of Industrial and Applied Mathematics*. 9(2). 186-195.
60. **Bhardwaj R.** & Chawla, M. (2017). Surface Roughness Effect on Dynamics of Carbon Nanotube. *Indian Journal of Industrial and Applied Mathematics*. 8(1). 24-33.
61. Kaur, M. & **Bhardwaj, R.** (2017). Saturn–Hyperion System Dynamics under the Influence of Aerodynamic Torque. *Indian Journal of Industrial and Applied Mathematics*. 8(1). 76-89.
62. **Bhardwaj, R.** (2017). Interactive of Atmospheric Components in Environmental Cycle. *Indian Journal of Industrial and Applied Mathematics*. 8(2). 167-172.
63. Das, M.K.; Saha, L.M. & **Bhardwaj, R.** (2017). Dynamical Complexities of Non-linear Physical and Biological Systems. *Indian Journal of Industrial and Applied Mathematics*. 8(2). 133-147.
64. Jain, D.; **Bhardwaj, R.** & Ahmad, I. (2017). Accelerating Order of Convergence Using Secant Type Methods. *Journal of Interdisciplinary Mathematics*. 20(2). 417-426.
65. **Bhardwaj, R.** & Pruthi, D. (2016). Time series and Predictability analysis of Air Pollutants in Delhi. *IEEE Xplore Digital Library*. 978-1-5090-3256-3/16. 553-560.

	<p>66. Saha, L.M.; Das, M.K. & Bhardwaj, R. (2016). On Nonlinear Dynamics, Chaos and Complexities. <i>Indian Journal of Industrial and Applied Mathematics</i>. 7(2). 270-284.</p> <p>67. Das, S. & Bhardwaj, R. (2016). Nonlinear Modelling of Competitive Ecosystem. <i>Indian Journal of Industrial and Applied Mathematics</i>. 7(1). 11-25.</p> <p>68. Chawla, M. & Bhardwaj, R. (2016). Surface roughness effect on couple stress fluid lubricated Porous pivoted slider bearings. <i>Journal of Information and Optimization Sciences</i>. 37(1). 13-22.</p> <p>69. Bhardwaj, R. & Bangia, A. (2016). Complex Dynamics of Meditating Body. <i>Indian Journal of Industrial and Applied Mathematics</i>. 7(2). 106-116.</p> <p>70. Bhardwaj, R. & Pruthi, D. (2016). Predictability and Wavelet Analysis of Air Pollutants for Commercial and Industrial Regions in Delhi. <i>Indian Journal of Industrial and Applied Mathematics</i>. 7(2). 165-174.</p> <p>71. Bhardwaj, R. & Kaur, M. (2016). Aerodynamic Torque exhibits non-resonance oscillation in satellite motion. <i>Mathematica Applicanda</i> 44(1). 247-262.</p>
<p>Papers Published in Conference Proceedings (last 5 years)</p>	<ol style="list-style-type: none"> 1. Datta, D. & Bhardwaj, R. (2020): Role of Astronomy in the fight against the COVID-19 Pandemic. <i>Revista INGLOMAYOR Ingeniera Global Mayor NEWSLETTER</i>. Volume 5. 01-23. 2. Bhardwaj, R. & Datta, D. (2019): Cutting Edge Science in Social Life. <i>Revista INGLOMAYOR Ingeniera Global Mayor NEWSLETTER</i>. Volume 3. 1-7. 3. Das, S. & Bhardwaj, R. (2018). Complexity analysis of atmospheric pollutants: Taj Mahal. <i>ATINER Conference Presentation Series No., ERT2016-0034</i>. pp. 1-8. ATINER Conference Presentation Series.ERT2016-0034. Athens. 4. Bhardwaj, R., Pruthi D. & Chawla M. (2018). Bifurcation analysis of ferro nanofluid flow with Fe₃O₄ nanoparticles. <i>Proceedings of the seventh DAE-BRNS interdisciplinary symposium on materials. 7th Interdisciplinary Symposium on Materials Chemistry. Bhabha Atomic Research Center, Mumbai, December 04-08, 2018.</i> 5. Pruthi, D. & Bhardwaj, R. (2016). Fractal analysis of air pollutants in India. <i>2nd International Conference on Signal Processing, Control and Data Analytics – 2016</i>. pp. SP 99- SP102.
<p>Books Authored/Book Volume Chapters</p>	<p><u>Books:</u></p> <ol style="list-style-type: none"> 1. Bhardwaj R. & Singh A.K. (2021). Programming in MATLAB with real life application(s). HP Hamilton Limited, United Kingdom

2. Siddiqi, A. H.; Manchanda, P. & **Bhardwaj, R.** (Ed.) (2016). *Mathematical Models, Methods and Applications*. Springer Science + Business Media Singapore.

Book Chapters:

1. Duhoon V. & **Bhardwaj, R.** (2022). Artificial Intelligence Techniques for Weather parameter Forecasting. (Ed. Yadav. A. 2nd IEEE IAS International Conference on Computational Performance Evaluation), North-Eastern Hill University (Central University), Shillong.
2. **Bhardwaj, R.** & Garg S. (2022). Water Resource Management Using Multi-Objective Optimization Techniques. (Ed. Maurya S P; Yadav A K; Singh R. *Modeling and Simulation of Environmental Systems: A Computation Approach*. CRC Press. Taylor and Francis Group, USA.
3. **Bhardwaj, R.** & Datta, D. (2021). Development of Epidemiological Modeling RD_COVID-19 of Coronavirus Infectious Disease and its Numerical Simulation. Ed. Agarwal P., Nieto J J, Ruzhansky M, Delfim F. M. Torres. *Analysis of Infectious Disease Problems (Covid-19) and Their Global Impact*. Pp 245-277. Springer.
4. **Bhardwaj R.**, Duhoon V. & Khan M. A.. (2021). Smart Technologies and Social Impact: An Indian Perspective of Contactless Technologies for Pandemic. Ed. Rana AK, Salau AC, Sharma S, Tayal S, Gupta S. *Internet of Things: Energy, Industry, and Healthcare*. Pp 275-299. CRC Press. Taylor and Francis Group, USA
5. **Bhardwaj, R.** & Datta, D. (2020). Consensus Algorithm. Ed. Mohammad A K, Mohammad T Q, Fahad A, Abdullah A. *Decentralised Internet of Things: A Blockchain Perspective*. Volume 71, "Studies in Big Data" pp 91-107. Springer.
6. **Bhardwaj, R.** & Bangia, A. (2020). Assessment of Stock prices variation using Intelligent Machine Learning Techniques for the prediction of BSE. Ed Kacprzyk J, Dutta D. & Mahanty B. *Advances in Intelligent Systems and Computing* Volume 979. Numerical Optimization in Engineering and Sciences, pp 159-166. Springer.
7. Bangia A., **Bhardwaj R.** & Jayakumar, K.V., (2020): River water quality estimation through Artificial Intelligence conjuncted with Wavelet Decomposition. Ed Kacprzyk J, Dutta D. & Mahanty B. *Advances in Intelligent Systems and Computing* Volume 979. Numerical Optimization in Engineering and Sciences, pp 107-123. Springer.

8. **Bhardwaj, R.** & Chawla, M. (2020). Convection Dynamics of SiO₂ Nanofluid. *Ed Kacprzyk J, Dutta D. & Mahanty B. Advances in Intelligent Systems and Computing* Volume 979. Numerical Optimization in Engineering and Sciences, pp 389-397. Springer.
9. **Bhardwaj, R.** & Das, S. (2020). Chaos Control Dynamics of Crypto Virology in Blockchain. *Ed: Shrivastava, G; Le, D N & Sharma, K. Crypto currencies and Blockchain Technologies and Applications: Decentralization and Smart Contracts.* Pp 129-148. Wiley SP Scrivener, USA.
10. Datta, D. & **Bhardwaj, R.** (2020). Fuzziness-Randomness modeling of Plasma Disruption in First Wall of Fusion Reactor Using Type I Fuzzy Random Set. *An Introduction to Fuzzy Sets.* Pp 91-113. Nova publisher Inc.
11. **Bhardwaj, R.** & Datta, D. (2020). Development of a Recommender System Health Mudra Using Blockchain for Prevention of Diabetes. *Ed. Mohanty SN, Elengar AA, Jain S, Gupta P, Chhatterjee J. Recommender System with Machine Learning and Artificial Intelligence: Particle Tools and Applications in Medical and Agricultural Domains.* Pp 313-327 Wiley & Sons, USA.
12. **Bhardwaj, R.** & Duhoon, V. (2020). Study and Analysis of Time Series of Weather Data of Classification and Clustering Techniques. *Eds. Gupta D, Khanna A, Bhattacharyya S, Hassanien A E, Anand S, Jaiswal A. Advances in Intelligent Systems and Computing* Pp 257-270.. Springer.
13. **Bhardwaj, R.** & Chawla, M. (2020). Convection dynamics of Nanofluids for temperature and magnetic field variations. *Eds. Gupta D, Khanna A, Bhattacharyya S, Hassanien A E, Anand S, Jaiswal A. Advances in Intelligent Systems and Computing.* Pp 271-290. Springer.
14. **Bhardwaj, R.** & Bangia, A. (2020). Computational Linguistic Analysis of Retail E-Commerce. *Ed: Siddiqi, A. H.; Singh, R.C. and Gowda, G.D.V. Computational Science and its Applications.* Pp 371-380. CRC Press (Taylor and Francis), USA.
15. **Bhardwaj, R.** & Bangia, A. (2020). Machine learned regression assessment of the HIV epidemiology development in Asian region. *Eds: Mishra J, Agarwal R & Atangana A. Mathematical Modeling and Soft Computing in Epidemiology,* pp 53-80.. Taylor & Francis.
16. **Bhardwaj, R.;** Bangia, A. & Mishra, J. (2020). Complexity Analysis of Pathogenesis of Coronavirus Epidemiology Spread in the China region. *Eds: Mishra J, Agarwal R & Atangana A.*

Mathematical Modeling and Soft Computing in Epidemiology, pp 247-272. Taylor & Francis.

17. **Bhardwaj, R.** & Bangia, A. (2019). Dynamical Forensic Inference for Malware in IoT-based Wireless Transmissions. Forensic Investigations and Risk Management in Mobile and Ed: Sharma, K; Makino, M; Shrivastava, G & Agarwal, B. *Wireless Communications* pp. 51-79. IGI Global, Hershey, PA.
18. **Bhardwaj, R.** & Bangia, A. (2019). Neuro-Fuzzy Analysis of Demonetization on NSE. Eds: Bansal, JC; Das, KN; Nagar, Atulya, D, Kumar. *Advances in Intelligent Systems and Computing (AISC)* 816, Soft Computing for Problem Solving (SocPros-2017). pp. 853-861. Springer Nature, Singapore.
19. **Bhardwaj, R.** (2019). Nonlinear Time Series Analysis of Environment Pollutants. Eds: Aslan, Z; Dökmen, F; Siddiqi, A. H. and Feoli, E. *Mathematical Modeling on Real World Problems: Interdisciplinary Studies in Applied Mathematics*. pp 71-102. NOVA
20. **Bhardwaj, R.** & Das, S. (2017). Chaos in Nanofluidic Convection of CuO nanofluid. Eds: Manchanda, P; Lozi, R & Siddiqi, A H. *Industrial Mathematics and Complex systems: Emerging Mathematical Models, Methods and Algorithms*. pp. 283-293. Springer Nature, Singapore.
21. **Bhardwaj, R.** & Pruthi, D. (2017). Fractal and Variability analysis of simulations in ozone level due to oxides of nitrogen and Sulphur. Eds: Chamola BP & Kumari P. *Advancement in Mathematical Sciences*. pp. 020007-1-020007-5.. American Institute of Physics.
22. **Bhardwaj, R.** (2016). Wavelets and Fractal Methods with environmental applications. Editors: Siddiqi, A H, Manchanda, P. & **Bhardwaj, R.** *Mathematical Models, Methods and Applications..* Pp.173-195. Springer Science + Business Media, Singapore.

No. of Conferences	National	Attended		Organized
		125		5
	International	30		1
Research Guidance	Awarded	PG	M. Phil	Doctorate
				14
	Undergoing			4

Research Projects	Completed	9		
	Undergoing	3		
Awards & Distinctions	<ul style="list-style-type: none"> • Fellow of Institute of Mathematics and applications, UK July 2021 onwards. • Visiting Associate 2020-2023 of Inter University Centre for Astronomy & Astrophysics (IUCAA), Pune, India • Member of Sectional Committee of the Section of Mathematical Sciences (including Statistics) for 2020-2021 (108th Session of Indian Science Congress) by Indian Science Congress Association, Professional body under Department of Science & Technology, Ministry of Science & Technology, Government of India. • Member of Sectional Committee of the Section of Mathematical Sciences (including Statistics) for 2019-2020 (107th Session of Indian Science Congress) by Indian Science Congress Association, Professional body under Department of Science & Technology, Ministry of Science & Technology, Government of India. • Government of India, Ministry of Earth Sciences, India Meteorological Department (IMD) awarded 27th Biennial MAUSAM Award (2012-2013) - cash prize (Rs. 50,000/-) & citation with co-authors on IMD day January 15, 2016; • GGSIPU Indraprastha University Internal Quality Assurance Cell (IIQAC) certificate of Appreciation for being member of The Indian Science Congress Association 2020. • GGSIPU Indraprastha University Internal Quality Assurance Cell (IIQAC) certificate of Appreciation for being Fellow of The Institute of Mathematics and Applications, UK, 2021. • GGSIPU Indraprastha University Internal Quality Assurance Cell (IIQAC) certificate of Appreciation for Best Researcher Award 2021. • GGSIPU Indraprastha University Internal Quality Assurance Cell (IIQAC) felicitated with a cash prize of Rs. 10,000/- for being recognized in the International Sphere. • Life Time Achievement Award 2022 in Nonlinear Dynamics - India's 73rd Republic Day Excellence Awards & International Day of Education Awards 2022, IMRF India, Registered by Niti Aayog, Govt. of India. 			

	<ul style="list-style-type: none"> • Bhardar Mata Abhinandan Samman 2022 by Bharat Mata Abhinandan Sangathan (Regd.) & TimesIndia Tv com, Happiness Club Indore International, International R & D creativity Organization USA on 16.01.2022. • FoXclues India Prime Top 100 Women Icon Award 2021 by FoXclues, FoXstory, Hindustan Times, Dailyhunt. • LIFETIME ACHIEVEMENT AWARD 2021 - International Scientist Awards on Engineering, Science and Medicine, awarded by VDGGOOD Professional Association on December 4-5, 2021. • Dr. Sarvepalli Radhakrishnan Distinguished Professor Award 2021 in Applied Mathematics, awarded by Center for Professional Advancement Continuous Education – CPACE on September 05, 2021. • Best Researcher Award 2020 - International Research Award on New Science Inventions NESIN 2020, ScienceFather, Registered by Ministry of Corporate Affairs, Govt. of India. • The Best Researcher Award 2013-2014 of Guru Gobind Singh Indraprastha University (GGSIPU) • The Best Researcher Award 2012-2013 of GGSIPU, • Best Researcher Award 2011-2012 of GGSIPU,
Administrative Assignments Handled	<ul style="list-style-type: none"> • Member, Board of Studies, Department of Mathematics, Punjabi Univeristy, Patiala, July 2020 onwards • Member, Board of Studies, Department of Mathematics, Jamia Millia Univeristy, Delhi, August 2020 onwards • Member Academic Council, Indian Institute of Finance, Greater Noida from April 2019 onwards • Vice Global Chief Editor, INGLOMAYOR, ISSN 0719 7578 (https://www.inglomayor.cl) from June 2020 onwards • Editor, Nepal Journal of Mathematical Sciences (NJMS), ISSN: 2738-9928 (Online), 2738-9812 (Print); Publisher: School of Mathematical Sciences, Tribhuvan University from January 2021 onwards. • Vice President, Research Club of Kanpur International (RCKI) with President Prof. J B Shukla, IIT Kanpur since April 2021 onwards. • Member IIF Research Council of Indian Institute of Finance, Greater Noida from August 2021 onwards
Association with Professional Bodies	<ul style="list-style-type: none"> • Fellow of Institute of Mathematics and Applications, UK, • Life member of Indian Science Congress Association (ISCA, The Indian Science Congress Association (Professional body under

Department of Science & Technology, Ministry of Science & Technology, Government of India).

- Member of Sectional Committee of the Section of Mathematical Sciences (including Statistics) for 2020-2021 (108th Session of Indian Science Congress) and
- Member of Sectional Committee of the Section of Mathematical Sciences (including Statistics) for 2019-2020 (107th Session of Indian Science Congress);
- Indian Academy of Social Sciences ISSA
- Joint Secretary of ISSA
- Councillor of ISSA
- Indian Mathematical Society
- Indian Society for Industry & Applied Mathematics
- Joint Secretary of ISIAM
- International Academy of Physical Sciences,
- Vijnāna Parishad of India
- Asian Society of Disaster Management Professionals
- Life Member of Human Rights Mission, Regd with Govt of India
- District DY. Chief Education Prot GB Nagar, Human Rights Mission
- Life member of Centre for Fundamental Research in Space Dynamics & Celestial Mechanics” (CFRSC) Delhi
- Vice Global Chief Editor, INGLOMAYOR,
- Visiting Associate of Inter University Centre for Astronomy & Astrophysics (IUCAA), An initiative of University Grants Commission, Govt. of India.
- Mmember of Board of Studies, Department of Mathematics, Punjabi Univeristy, Patiala
- Mmember of Board of Studies, Department of Mathematics, Jamia Millia Islamia Univeristy, Delhi
- Member of Academic Council of the Indian Institute of Finance
- Vice President, Research Club of Kanpur International (RCKI) with President Prof. J B Shukla, IIT Kanpur
- Honorary Member of Centre for Advanced Research in Applied Mathematics and Physics (CARAMP),
- American Mathematical Society (AMS),
- Gwalior Academy of Mathematical Sciences (GAMS),
- Editor of Indian Journal, of Industrial and Applied Mathematics,
- Chairperson of Task Force of XLII Indian Social Science Congress, December 27-31, 2018, KIIT University, Bhubaneswar, Orissa.

<p>Any Achievements</p>	<p>other <u>PATENT(s)</u></p> <ol style="list-style-type: none"> 1. Bhardwaj R., Datta D., Bhardwaj R., Sharma S., Bhardwaj, S. (2021): IoT and cloud-based system and method for smart drainage monitoring, early detection and rectification. Journal Number 07/2021. Publisher: The Indian Patent Office, New Delhi, India. 2. Bhardwaj R., Datta D., Bhardwaj R., Datta D., Bhardwaj, S (2020): System and method for a handy computed tomography device for scanning lungs and internal organs. Journal Number 39/2020. Publisher: The Indian Patent Office, New Delhi, India. 3. Bhardwaj R., Datta D., Bhardwaj R., Bhardwaj, S., Sharma S., Sharma SK, Shehri MA (2020): An apparatus and method with IoT to detect and control temperature change simulation case. Journal Number 26/2020. Publisher: The Patent Office, New Delhi, India.
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