Curriculum Vitae

Personal Details

Name	:	Dr. Pradeep Kumar Sahu
Date of Birth	:	20 March, 1997
Marital Status	:	Unmarried
Address	:	Department of Basic Science and Humanities Indian Institute of Information Technology Bhagalpur Bhagalpur - 813210 (Bihar), India
E-mail IDs	:	pradeep97sahu@gmail.com pradeep_2321ma03@iitp.ac.in
Mobile No.	:	(+91) 7999760600
Google Scholar	:	https://tinyurl.com/yzzrh373

Current Affiliation

At present, I am an Assistant Professor of Mathematics at Indian Institute of Information Technology Bhagalpur.

Educational Qualifications

Degree	**School / College / Institution (Board / University)**	**Year of Passing**	**Percentage / CPI (Max 10)**
Ph.D.	Indian Institute of Technology Patna	2025	NA
M.Sc.	Indian Institute of Technology Dhanbad	2020	8.34
B.Sc.	Pt. Ravishankar Shukla University Raipur	2017	76.11
Higher Secondary	Chhattisgarh Board of Secondary Education	2014	84.4
High School	Chhattisgarh Board of Secondary Education	2012	64.5

Research Interests

Computational Finance and Deep Learning Approaches for Option Pricing

Doctoral Thesis

Title: Numerical and Data-Driven Approaches for Option Pricing Problems.
Advisor: Dr. Kuldip Singh Patel, Department of Mathematics, IIT Patna

M.Sc. Project

Title: Study of Water Wave Scattering by Porous Walls with an Abrupt Change in Water Depth.
Advisor: Dr. Ramanababu Kaligatla, Department Mathematics & Computing IIT (ISM) Dhanbad

Publications

1. Sahu, P. K.; Patel, K. S., "High order method for variable coefficient integro-differential equation and inequalities arising in option pricing", *International Journal of Numerical Analysis & Modeling*, **2023**, vol. 20, no. 4, https://doi.org/10.4208/ijnam2023-1023.

2. Sahu, P. K.; Patel, K. S.; Behera, R., "Three-time levels compact scheme for pricing European options under regime switching jump-diffusion models", In: *International Conference on Mathematics and Computing, Springer*, **2023**, pp. 367–378, https://doi.org/10.1007/978-981-99-3080-7_27.

3. Sahu, P. K.; Patel, K. S., "High-order accurate variable time step compact schemes for pricing vanilla and exotic options", *Journal of Applied Mathematics and Computing*, **2024**, vol. 70, no. 5, pp. 4021–4052, https://doi.org/1 0.1007/s12190-024-02118-z.

4. Sahu, P. K.; Patel, K. S., "Variable time step operator splitting methods with stability and error estimates for pricing American options", *International Journal of Computer Mathematics*, **2025**, https://doi.org/10.1080/00207160. 2025.2541313.

5. Sahu, P. K.; Patel, K. S.; Mishra, P. K., "Stability and error estimates of operator splitting methods on a variable space-time grid for American options with jumps", *Computational Economics*, **2025**, https://doi.org/10.1007/s106 14-025-11025-9.

6. Sahu, P. K.; Patel, K. S.; Bhuruth, M., "Stability and error estimates of operator-splitting methods for pricing American option under regime-switching model with jumps", *Numerical Algorithms*, **2025**, https://doi.org/10.1007/s110 75-025-02178-7.

7. Goswami, A.; Patel, K. S.; Sahu, P. K., "A novel difference equation approach for the stability and robustness of compact schemes for variable coefficient PDEs", *Computational and Applied Mathematics*, **2025**, vol. 44, no. 5, pp. 213, https://doi.org/10.1007/s40314-025-03142-w.

Works Under Review

1. Sahu, P. K.; Jha, P. K.; Pandey, D. K.; Patel, K. S., "Assessing the impact of MGNREGA and PDS on agricultural labour availability".

2. Sagar, R.; Sahu, P. K.; Patel, K. S., "Hybrid Richardson finite difference scheme for multi-dimensional and system of PDEs arising in option pricing".

3. Sahu, B.; Sahu, P. K.; Patel, K. S., "A Robust Redefined Uniform Hyperbolic Polynomial B-spline Collocation Scheme for Option Pricing Problem".

4. Shubham, K.; Sahu, P. K.; Tiwari, V.; Patel, K. S., "Price prediction for OTM and ITM European options in stock market through predictive learning".

Achievements / Scholarships

- Awarded **Gold Medal** for securing first rank (overall topper) in B.Sc., 2017.
- Qualified **IIT-JAM 2018** with AIR 537; offered admission to M.Sc. at IIT Dhanbad (2018–2020).
- Received **Merit-cum-Means Scholarship**, IIT Dhanbad (2019–2020).
- Qualified **UGC-NET** with AIR 71; awarded OBC National Fellowship, Dec 2019.
- Secured **1st Rank** in *Numerical Linear Algebra* (NPTEL Online Certification), 2022.
- Qualified **GATE 2022** with AIR 732.
- Selected for **Internship under VRITIKA Scheme**, supervised by Dr. Pawan Kumar Mishra, Department of Mathematics, IIT Bhilai.

Teaching Assistant at IIT Patna

- Probability and Statistics
- Statistics for Data Science Lab (Python)
- Introduction to Machine Learning Lab (Python)
- Data Analytics Lab (Python)
- Calculus and Linear Algebra

Technical Skills

MATLAB, Python, C Programming, C++,

Workshops / Conference Attended

- Attended a FDP on *Introduction to Financial Mathematics: Exploring the Machine Learning Approach for Option Pricing Problems in the Stock Market*, Center for Applied Mathematics, IIIT Naya Raipur, India (August 2021).
- Attended workshop on *MATLAB for Beginners*, DST (FIST) Sponsored, School of Mathematics, Thapar Institute of Engineering and Technology, Patiala, India (October 2021).
- Attended the 2^{nd} *International Workshop on Advanced Topics in Mathematics (IWATM)*, Center for Applied Mathematics, IIIT Naya Raipur, India(October 2021).
- Delivered a contributed talk at the *International Conference on Computational Partial Differential Equations and Applications (ICCPDEA)*, BML Munjal University, India (September 2022).
- Presented a paper at the 9^{th} *International Conference on Mathematics and Computing (ICMC)*, Department of Mathematics, BITS Goa, India (January 2023).
- Attended the *National Conference on Differential Equations: Theory, Method and Application (NCDE)*, Department of Mathematics, Indian Institute of Technology Patna, India (March 2023).
- Attended the 5^{th} *International Conference on Mathematical Techniques and Applications (ICMTA) & Workshop on Scientific Computing, Modeling and Deep Learning (WSCMDL)*, SRM Ramapuram, Chennai, India (January 2024).

Academic Memberships

Member of the Indian Mathematical Society (IMS)

Others

- **Hobbies**: Playing Cricket and Badminton
- **Language**: Hindi and English

Referees

- Dr. Kuldip Singh Patel, Assistant Professor, Department of Mathematics, IIT Patna
  Email: kspatel@iitp.ac.in
- Dr. Anindya Goswami, Associate Professor, Department of Mathematics, IISER Pune
  Email: anindya@iiserpune.ac.in
- Prof. Muddun Bhuruth, Professor, Department of Mathematics, University of Mauritius, Reduit
  Email: mbhuruth@uom.ac.mu
- Dr. Ratikanta Behera, Assistant Professor, Department of Computational and Data Sciences, IISc Bangalore, India
  Email: ratikanta@iisc.ac.in