



## Priya Kumari Singh, M.Sc.

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**Designation** : Assistant Professor  
**Department** : Department of Basic Science and Humanities  
(JOINED THE INSTITUTE IN 2023)  
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### RESEARCH INTERESTS

Numerical solution of stochastic differential and integral equations:

- ✓ Solution of linear stochastic Itô – Volterra integral equation by using shifted Jacobi operational matrix method.
- ✓ Galerkin method based on shifted Jacobi polynomial to approximate solution of nonlinear stochastic Itô – Volterra integral equation.
- ✓ Lusas operational matrix method to solve multi-dimensional stochastic integral equations.
- ✓ Quintic B-spline collocation method; barycentric Lagrange interpolation function; barycentric rational interpolation function.
- ✓ Stochastic differential equation driven by fractional Brownian motion; stochastic fractional differential equations.

### Academic Qualifications

M. Sc. (Mathematics), NIT Durgapur, India (Gold)

Specialization: Stochastic differential and integral equations.

### Teaching Experience/Industrial Experience/Research Experience

- ✓ MA-2305: Numerical Analysis (Session instructor in Department of Mathematics, NIT Rourkela)
- ✓ MA-6633: Numerical solutions of ODE and PDE (Grader in department of Mathematics, NIT Rourkela)

## PUBLICATIONS

## JOURNAL &amp; CONFERENCES

- [1]. P. K. Singh and S. Saha Ray, 2023, An efficient numerical method based on Lucas polynomials to solve multi-dimensional stochastic Itô–Volterra integro-differential equations. *Mathematics and Computers in Simulation* (Elsevier), 203, pp. 826–845. (SCI IMPACT FACTOR : 4).
- [2]. P. K. Singh and S. Saha Ray, 2022, Two reliable methods for numerical solution of nonlinear stochastic Itô–Volterra integral equation. *Stochastic Analysis and Applications* (Taylor and Francis), 40(5), pp. 891-913. (SCI Journal, Impact Factor: 1.3).
- [3]. P. K. Singh and S. Saha Ray, 2023, An efficient numerical method based on Lucas polynomials to solve multi-dimensional stochastic Itô–Volterra integral equations. *Mathematics and Computers in Simulation* (Elsevier), 203, pp. 826-845. (SCI Impact Factor: 4.6).
- [4]. P. K. Singh and S. Saha Ray, 2022, A novel operational matrix method based on Genocchi polynomials for solving n-dimensional stochastic Itô–Volterra integro-differential equation. *Mathematical Sciences* (Springer), pp. 1-11. (SCI Impact Factor: 2).
- [5]. P. K. Singh and S. Saha Ray, 2023, A Novel Study Based on Shifted Jacobi Polynomials to Find the Numerical Solutions of Nonlinear Stochastic Differential Equations Driven by Fractional Brownian Motion, *Computational Methods in Applied Mathematics* (De Gruyter) (SCI Impact Factor: 1.3).
- [6]. P. K. Singh and S. Saha Ray, 2023, Shifted Chebyshev spectral Galerkin method to solve stochastic Itô–Volterra integro-differential equations driven by fractional Brownian motion appearing in mathematical physics. *Computational and Applied Mathematics* (Springer), 42(3), p. 120. (SCI Impact Factor: 2.6).

## ANY OTHER

Book Chapter/  
Conferences attended

1. Indo-German conference on Computational Mathematics (IGCM-2023), IISc Bangalore (Jointly organised by Department of CDS IISc and IWRH Heidelberg Germany) Mar 2023.
2. 2nd International Conference on Orthogonal Polynomials, Special functions, and Computer Algebra: Applications in Engineering (OPSFCA-2022), Anand-ICE, Jaipur, Oct 2022.
3. Short Term Training Workshop Program entitled “Emerging Applications of Mathematics and Statistics in Engineering Science and Technology (EAMSEST-2022)”, NIT Rourkela (Organized by the Department of Mathematics, National Institute of Technology Rourkela, India.) May 2022.
4. 1st International Conference on Applied Analysis, Computation and Mathematical Modelling in Engineering (AACMME-2021), NIT Rourkela, Feb 2021.