

Dr. MANISHA SINHA

Assistant Professor
Bharati Vidyapeeth Deemed University
Dept. Of Engineering & Technology
Navi Mumbai
PhD, IIT Delhi

E: manisha.sinha@bvucoep.edu.in

Summary

PhD, Computational Finance, Dept. of Mathematics, Indian Institute of Technology Delhi

Thesis title - Numerical Solution of Some Option Pricing Models

Research Supervisor – Prof. S. Chandra Sekhara Rao

Research Interest

Numerical Analysis, Computational Finance – algorithm, analysis and numerical results interpretations, Numerical solution of Option pricing problems arising in Finance in the form of Partial Differential Equations, Generalized Black-Scholes model for European call option, binary call option, long call butterfly spread option and portfolio of options with butterfly spread delta function as the final condition, Generalized Asian option pricing model in one and two dimensional forms, Generalized Jump-Diffusion model, Black-Scholes models for two risky assets (such as two-asset digital call option, relative outperformance call option, exchange option and product call option)

Computational Skills

MATLAB, LaTeX, MS Office, Libre Office, Linux(basic), Python(basic), R(basic)

Research Publication and working papers

- ❑ **Numerical solution of generalized Black-Scholes model**, Appl. Math. Comput. 321:401-421, 2018 (with S. C. S. Rao).
- ❑ **High-order numerical method for generalized Black-Scholes model**, Proceedings of ICCS-2016, San Diego, Procedia Computer Science, 80:1765-1776, 2016 (with S. C. S. Rao).
- ❑ **A Computational Technique for Asian Option Pricing Model**, ICCS 2019, LNCS 11538: 326-339, 2019 (with S. C. S. Rao).
- ❑ **Numerical solution of generalized Asian option pricing model without dimension reduction**, Communicated (with S. C. S. Rao).
- ❑ **Numerical solution of generalized Jump-Diffusion model for option pricing**, Communicated (with S. C. S. Rao).
- ❑ **Numerical solution of Black-Scholes model for two-asset option pricing**, Manuscript (with S. C. S. Rao).

Paper Presented

- ❑ **Numerical solution of generalized Asian option pricing model without dimension reduction**, International Conference - “Recent Advances in Theoretical and Computational Partial Differential Equations with Applications” TCPDE-2016, 05-09 December 2016, Panjab University, Chandigarh, India.

Academic Credentials

- ❑ **Ph.D.** in Computational Finance from Dept. of Mathematics, Indian Institute of Technology Delhi, Awarded in Nov-2017
Thesis title: Numerical Solution of Some Option Pricing Models
Thesis supervisor: Prof. S. Chandra Sekhara Rao

CGPA: 7.7 on a 10-point scale in Pre PhD coursework

Pre-Ph.D. courses:

- Linear Algebra
- Numerical Optimization
- Numerical and Computational Methods
- Applied Numerical Analysis
- Financial Mathematics
- Advanced Dynamic Oceanography

- ❑ **M.Sc.** (Mathematics and Statistics), Dr. Ram Manohar Lohia Avadh University, Ayodhya, U.P., 2006-2008. Percentage scored: 68.40%
- ❑ **B.Sc.** (Mathematics, Physics, Chemistry), K.S. Saket P.G. College, Ayodhya, U.P., 2003-2006. Percentage scored: 65.00%
- ❑ **Intermediate**, Canossa Convent Girls' School, Ayodhya, U.P., 2001-2003. Percentage scored: 74.4%
- ❑ **High School**, Canossa Convent Girls' School, Ayodhya, U.P., 2001-2003. Percentage scored: 71.83%

Teaching Experience

Assistant Professor (January 2023 – till date), Bharati Vidyapeeth Deemed University, Department of Engineering and Technology, Off Campus, Navi Mumbai

- Mathematics for Computing II
- Statistical Methods (with Practical using R)
- Statistics, Probability & Calculus (Practical using Excel)
- Probability & Statistics (with Practical using Python and Excel)
- Statistical Methods & Modelling (with Practical using R)

Teaching Assistant (July 2009 – June 2014), Dept. of Mathematics, IIT Delhi, New Delhi

- MAL124 Introduction to Algebra and Matrix Analysis
- MAL110 Mathematics I
- MAL230 Numerical Methods and Computation
- MAL517 Differential Equations
- MAL001 Preparatory Course
- MAL518 Methods of Applied Mathematics
- MAL524 Numerical Analysis

Awards/Scholarships

- ❑ GATE (Graduate Aptitude Test in Engineering) 2009, Score 505, Percentile 97.36, All India Rank 67
- ❑ National Board for Higher Mathematics (NBHM) Ph.D. Scholarship, 2009, Department of Atomic Energy (DAE), Government of India.
- ❑ NET (National Eligibility Test) (JRF (Junior Research Fellowship) and Lectureship), UGC-CSIR, June 2009
- ❑ NET (National Eligibility Test) (Lectureship), UGC-CSIR, December 2008

Workshops Attended

- ❑ Workshop on Financial Engineering, September 11, 2010, IIT Delhi, New Delhi, India.
- ❑ International Workshop on Advances in Computational Partial Differential Equation, February 07 - March 05, 2011, BITS-Pilani, GOA Campus, Goa, India.

- ❑ International Workshop on Adaptive Finite Element Methods, March 16 – March 25, 2012, IIST Trivandrum, Trivandrum, India.
- ❑ National Programme on Differential Equations: Theory, Computation and Applications, PG Level, May 14 - June 02, 2012, IIT Delhi, New Delhi, India.
- ❑ Workshop on Mathematical Finance WMF 2012, Oct 29-Nov 03, 2012, IIT Guwahati, India.
- ❑ Computational Techniques and Mathematical Modeling, April 05 - April 06, 2013, Department of Mathematics, South Asian University, New Delhi, India.
- ❑ Orthogonal Spline Collocation Methods (OSCM) for Partial Differential Equations, March 21-March 24, 2014, Department of Mathematics, South Asian University, New Delhi, India.