

Curriculum Vitae

Shruti Dubey

Affiliation:

Department of Mathematics,
Indian Institute of Technology Madras,
Chennai-600063.

Email : shrurkd@gmail.com

sdubey@iitm.ac.in

Phone : 044-22574639 (O)

: 9789075475 (M).

<http://www.iitm.ac.in>.

Present Position: Associate Professor, [Department of Mathematics](#), Indian Institute of Technology Madras, Chennai, India.

Academic Background:

- o **Ph.D.** : Department of Mathematics and Statistics, Indian Institute of Technology Kanpur, India. www: <http://www.iitk.ac.in/>
 - Thesis Title: "*An investigation of some nonlinear functional differential equations and their applications*".
 - **Thesis Supervisor:** Professor D. Bahuguna
- o **Master of Science** in Mathematics, 1998-2000, Indian Institute of Technology, Roorkee, India. www: <http://www.iitr.ac.in/>
- o **Bachelor of Science** in Mathematics, Physics, Chemistry, 1995-1998 CCS University Meerut, India. www: <http://ccsuniversity.org/>.

Work Experience:

- **Sep 2009-Aug 2010**, Research visitor at Laboratoire d'Analyse et d'Architecture des Systèmes du CNRS (LAAS-CNRS), **Toulouse, France**.
- **Sep 2008-Aug 2009** : Post-Doctoral Fellow at Laboratoire d'Analyse et d'Architecture des Systèmes du CNRS (LAAS-CNRS), Toulouse, France and **Institut de Mathématiques de Bordeaux, France**.
- **Sep 2007-July 2008** : NBHM Post-Doctoral Fellow at Indian Institute of Information Technology, Design & Manufacturing, Jabalpur, Madhya Pradesh, India.
- **Dec 2005-July 2007** : Lecturer at Department of Mathematics, Birla Institute of Technology and Science, Pilani, Rajasthan, India.

Research Interest:

- o Mathematical study of ferromagnetic systems
- o Nonlinear analysis for fractional functional differential equations

Research Experience:

I am working on control and numerical analysis of ferromagnetic systems since August 2008. In particular, I am trying to model the ferromagnetic materials for the control of the magnetic moments. I am also involved in applying the theory of semigroups, theory of m -accretive operators and method of semidiscretization to various kind of differential equations to study the existence and uniqueness of its solutions. Specifically, I dealt with retarded differential equations, functional differential equations and neutral differential equations with nonlocal initial conditions. Differential equations with nonlocal conditions are invaluable because of their practical application to many physical areas such as population dynamics, investigation of pollution processes in rivers, seas, which are caused by sewage etc.. I also did numerical study of such problems and have proposed

a method of numerical approximate solution for sobolev-type equation subject to an initial and a nonlocal boundary condition. Sobolev-type equation appears in a variety of physical problems such as flow of fluid through fissured rocks, thermodynamics and propagation of long waves of small amplitude.

List of Publications

Journal Publications :

1. **Sharad Dwivedi and Shruti Dubey**, "On Dynamics of Current-Induced Static Wall Profiles in Ferromagnetic Nanowires Governed by the Rashba Field", International Journal of Applied and Computational Mathematics, Vol. 3, No.1 (2017) pp 27-42.
2. **Madhukant Sharma and Shruti Dubey**, Analysis of Fractional Functional Differential Equations of Neutrial type with Nonlocal conditions, Differential Equations and Dynamical Systems (2016) DOI: 10.1007/s12591-016-0290-1
3. **Madhukant Sharma and Shruti Dubey**, Controllability of Sobolev type Nonlinear Nonlocal Fractional Functional Integro-differential Equations, Progress in Fractional Differentiation and Applications, Vol.1 No 4(2015) pp. 281-293.
4. **Shruti Dubey, Madhukant Sharma**, Solutions to Fractional Functional Differential Equations with Nonlocal Conditions, Fract. Calc. Appl. Anal., Vol. 17, No 3(2014), pp. 654-673; DOI: 10.2478/s13540-014-0191-3. Impact Factor : 2.974
5. **Madhukant Sharma and Shruti Dubey**, Asymptotic Behavior of Solutions to Nonlinear Nonlocal Fractional Functional Differential Equations, J. Nonl. Evol. Equ. Appl., Vol. 2015, No.2(2015), pp 21-30.
6. **Madhukant Sharma and Shruti Dubey**, Controllability of Nonlinear Fractional Functional Differential Equations with Nonlocal Conditions, Int. J. of Dynamical Systems and Differential Equations, Vol. 5 No 4(2015), pp 302-321.
7. **Shruti Agarwal, Gilles Carbou, Stephane Labbe and Christophe Prieur**, Control of a network of magnetic ellipsoidal samples, Mathematical Control and Related Field, AIMS, 1(2011), no. 2, pp. 129-147. Impact Factor : 1.095
8. **Shruti A. Dubey**, The method of lines applied to nonlinear nonlocal functional differential equations, Journal of Mathematical Analysis and Application, 376(2011), issue 1, pp. 275-281. Impact Factor : 1.119
9. **Shruti A. Dubey**, Numerical solution for nonlocal sobolev-type differential equations, Electronic Journal of Differential Equations, Conf. 19 (2010), pp. 75–83. Impact Factor : 0.419
10. **Shruti A. Dubey and D. Bahuguna**, Existence and regularity of solutions to nonlocal retarded differential equations, Applied Mathematics and Computation, 215(2009), pp. 2413-2424. Impact Factor : 1.6
11. **D. Bahuguna and S. Agarwal**, Approximations of solutions to neutral functional differential equations with nonlocal history conditions, Journal of Mathematical Analysis and Application 317 (2006), no. 2, 583-602. impact Factor : 1.119
12. **S. Agarwal and D. Bahuguna**, Existence of solutions to sobolev type partial neutral differential equations, Journal of Applied Mathematics and Stochastic Analysis (2006), 10pp, DOI 10.1155/JAMSA/2006/16308.
13. **S. Agarwal and D. Bahuguna**, Exact and approximate solutions of delay differential equations with nonlocal history conditions, Journal of Applied Mathematics and Stochastic Analysis 2005 (2005), no.2, 181-194.
14. **S. Agarwal and D. Bahuguna**, Existence and uniqueness of strong solutions to nonlinear nonlocal functional differential equations, Electronic Journal of Differential Equations (2004), no. 52, 9pp. Impact Factor : 0.419
15. **S. Agarwal and D. Bahuguna**, Method of semidiscretization in time to nonlinear retarded differential equations with nonlocal history conditions, International Journal of Mathematics and Mathematical Sciences 2004 (2004), no. 37, 1943-1956.

Book Chapter:

- o **S. Agarwal** and **D. Bahuguna**, Semidiscretization of nonlinear retarded differential equations, Differential Equations and Dynamical Systems. Editor: Dr. D. Bahuguna. ISBN: 81-7319-588-9. Narosa Publishing House, India, 2004, pp. 107 – 117.

Conference papers published in proceedings :

1. **Sharad Dwivedi and Shruti Dubey**, Field Driven Motion of Ferrofluids in Ferromagnetic Nanowire under the influence of Inertial Effects *Procedia Engineering*, Volume 127, Pages 1-1378 (2015) INTERNATIONAL CONFERENCE ON COMPUTATIONAL HEAT AND MASS TRANSFER (ICCHMT) – 2015.
2. **Sharad Dwivedi and Shruti Dubey**, On Stability of Steady-States for a Two-Dimensional Network Model of Ferromagnetic Nanowires, *Analysis, Modelling, Optimization and Numerical Techniques Series: Springer Proceedings in Mathematics & Statistics*, International Conference on Recent Trends in Mathematical Analysis and Its Applications (ICRTMAA), Dec. 21-23, 2014.
3. **Shruti Dubey**, Control and Stability of One Dimensional Ferromagnetic System, International Conference on Advances in Modeling, Optimization and Computing (AMOC – 2011), IIT Roorkee, Dec. 5-7 2011.
4. **Shruti Agarwal, D. Bahuguna**, A study of a class of nonlocal delay differential equations, National Conference on Mathematical Modeling and Analysis, Birla Institute of Technology and Sciences, Pilani, October 8-9, 2004.

Invited Talks :

1. Controllability of fractional order differential equations with nonlocal initial condition, International conference on Recent advances in theoretical & computational partial differential equations and applications, Panjab University, Chandigarh, December 5-9, 2016.
2. Control of 2D ferromagnetic system governed by Landau-Lifschitz equation, International Conference on PDEs: Theory and Computation, South Asian university, New Delhi, December 28-30, 2015.
3. A study of controllability of ferromagnetic material, National Conference on Evolution Equations: Theory, Methods & Applications (NCEETMA – 2012), IIT Kanpur, December 7 – 8, 2012.

Conference/ Workshop/Seminar Presentations:

1. Control and Stability of One Dimensional Ferromagnetic System, International Conference on Advances in Modeling, Optimization and Computing (AMOC – 2011), IIT Roorkee, Dec. 5-7 2011.
2. A network of ferromagnetic ellipsoidal samples, IFAC workshop on Control of Distributed Parameter Systems, Toulouse, **France**, July 20-24, 2009.
3. Numerical solution for nonlocal sobolev-type differential equations, 8th MSU-UAB Conference on Differential Equations and Computational Simulations, Mississippi State University, **U.S.**, May 7-9, 2009.
4. A study of a class of nonlocal delay differential equations, National Conference on Mathematical Modeling and Analysis, Birla Institute of Technology and Sciences, Pilani, October 8-9, 2004.
5. Application of method of semidiscretization to nonlinear functional differential equations with nonlocal history conditions, Workshop on Wavelet Analysis and Applications, Institute of Mathematics and Applications, Bhubaneswar, February 7-11, 2004.

Conference/ Workshop/Seminar Participated:

1. International conference on Recent advances in theoretical & computational partial differential equations and applications, Panjab University, Chandigarh, December 5-9, 2016.
2. International Conference on PDEs: Theory and Computation, South Asian university, New

Delhi, December 28-30, 2015

3. International Congress of Mathematicians, (ICM 2014), Coex, Seoul, Korea, Aug 13-21 2014.
4. National Conference on Evolution Equations: Theory, Methods & Applications (NCEETMA – 2012), IIT Kanpur, December 7 – 8, 2012.
5. International Conference on Advances in Modeling, Optimization and Computing (AMOC – 2011), IIT Roorkee, Dec. 5-7 2011.
6. IFAC workshop on Control of Distributed Parameter Systems, Toulouse, France, July 20-24, 2009.
7. 8th MSU-UAB Conference on Differential Equations and Computational Simulations, Mississippi State University, U.S., May 7-9, 2009.
8. Instructional School on Computational Partial Differential Equations (CPDE-05), Indian Institute of Technology Bombay, June 5-24, 2005.
9. Symposium on the Current Trends in Biomathematics, Indian Institute of Technology Roorkee, March 14, 2005.
10. Workshop on the Nonlinear Dynamical Models and their Behavior, Indian Institute of Technology Roorkee, March 11-13, 2005.
11. National Conference on Mathematical Modeling and Applied Analysis, Birla Institute of Technology and Sciences - Pilani, October 8-9, 2004.
12. Annual Conference on Orissa Mathematical Society, Institute of Mathematics and Applications - Bhubaneswar, February 7-8, 2004.
13. Workshop on Wavelet Analysis and Applications, Institute of Mathematics and Applications - Bhubaneswar, February 9-11, 2004.

Research Guidance :

S. No.	Research Degree	Name of the scholar	Area of Research/Title of thesis	Current status
1	PhD	Madhukant Sharma	An Investigation of Nonlocal Fractional Order Functional Differential Equations	Completed
2	PhD	Sharad Dwivedi	Mathematical Study on Nonlinear Magnetization Dynamics in Ferromagnetic Nanostructures	Completed
3	PhD	Mansur Alam	Ongoing	
4	PhD	Ranjeet	Ongoing	
5	PhD	Chirnjeev	Ongoing	
6	PhD	KamalKant Mishra	Ongoing	

Teaching Experience:

Courses Taught (at IIT Madras) :

Course Title	Level
Functions of one variable	UG (Core)
Functions of several variables	UG (Core)
Numerical Methods	UG (Elective)
Differential Equations	UG (Elective)

Multivariable Calculus	PG (Core)
Linear Algebra and Numerical Analysis	UG (Elective)
Nonlinear differential equations	PG (Elective)
Modelling workshop	PG
Simulation lab	PG
Series and Matrices	UG (Core)
Partial Differential Equations	PG (Core)

Courses Taught (at BITS Pilani) :

Course No & Title	Level	Number of Times	Remarks
MATH C192 –Mathematics-II (Linear Algebra and Complex Analysis)	UG (Core)	Twice	Instructors Incharge
MATH-C191 – Mathematics-I (Advance Calculus)	UG (Core)	Once	
MATH-C241 – Mathematics-III (Ordinary and Partial Differential Equations)	UG (Core)	Once	
AAOC-C111 – Probability and Statistics	UG (Core)	Twice	

Courses Taught (at IIT Kanpur) (during Ph.D) :

Course No & Title	Level	Number of Times	Remarks
MTH-203 – Mathematics-III	UG (Core)	Once	Tutor

- o Teaching Assistant in various courses taught in the Department of Mathematics IIT Kanpur.

Computer Skills:

- Operating Systems: Linux, MS Windows
- Programming Languages: Matlab, C/C++.
- Software Packages: Xfig, Latex, GNU-GSL, MS - Office etc.

Prizes/Awards/Honours

- o **Best Paper Award** for their paper entitled ‘**Field-driven Motion of Ferrofluids in Ferromagnetic Nanowire under the Influence of Inertial Effect**’ at the International Conference on Computational Heat and Mass Transfer (**ICCHMT-2015**) held in Warangal.
- o Received NBHM post-doctoral fellowship in 2006.
- o Qualified Graduate Aptitude Test in Engineering (GATE), March 2001.
- o Recipient of IIT, Roorkee Merit Scholarship (1998-2000)
- o Merit scholarship since 6th grade to B. Sc.

Personal Summary:

Name Dr. Shruti Dubey
Nationality Indian
Sex Female
Date of birth 20th June 1976
Marital Status Married
Permanent Address 59-B, Lal Bagh, Muzaffar Nagar,
Uttar Pradesh, India. PIN: 251001.
Tel : +91-131-2411483
Present Address Shruti Dubey
D-15-29, Bonn Avenue,
IIT Madras, Chennai 600036.
Mobile : +44-9789075475.
Email shrurkd@gmail.com
sdubey@iitm.ac.in

List of Referees:

<p>1. Prof. D. Bahuguna, Department of Mathematics, IIT Kanpur- 208016, INDIA Email: dhiren@iitk.ac.in Phone: +91-512-2597053 (O) Fax : +91-512-2597500.</p>	<p>2. PRIEUR Christophe, Gipsa-Lab Department of Automatic Control Domaine universitaire 961, rue de la Hauille Blanche BP 46, 38402 Grenoble cedex France Email: Christophe.Prieur@gipsa-lab.grenoble-inp.fr Phone: +33-476826482 Fax : +33-476826483</p>
<p>3. Prof. M. K. Kadalbajoo, Department of Mathematics, IIT Kanpur- 208016, INDIA Email: kadal@iitk.ac.in Phone: +91-512-2597732 (O) Fax : +91-512-2597500 .</p>	

I, hereby, declare that all the details given above are true to the best of my knowledge and conviction.

Shruti Dubey