

**BARANI BALAN NATESAN**  
Assistant Professor of Mathematics

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Web: <https://sites.google.com/view/baranibalann>



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## EDUCATIONAL QUALIFICATIONS

Ph.D. (Mathematics), Bharathiar University, Coimbatore.

M.Phil. (Mathematics), Bharathiar University, Coimbatore.

## ACADEMIC EXPERIENCE

- Assistant Professor (on contract), Department of Mathematics, School of Mathematics and Computer Sciences, Central University of Tamil Nadu, Thiruvarur, July 2012-April 2013
- Assistant Professor, Department of Mathematics, School of Mathematics and Computer Sciences, Central University of Tamil Nadu, Thiruvarur, April 2013 - till now

## AWARDS & RECOGNITION

1. Young Scientist under DST - SERB Fast Track Scheme, 2014
2. **Travel Grant:** Full Travel Support to attend 8th International Congress on Industrial and Applied Mathematics (ICIAM 2015) held at Beijing, China during August 10-14, 2015 by NBHM, DAE, Mumbai.
3. **Conference Grant:** Financial Grant to organize Conference on Control and Inverse Problems at CUTN by NBHM, DAE, Mumbai, February 26-27, 2016
4. **Conference Grant:** Financial Grant to organize Workshop on Partial Differential Equations and Applications at CUTN by NBHM, DAE, Mumbai, May 29-June 11, 2017
5. **Conference Grant:** Financial Grant to organize National Conference on Control and Inverse Problems at CUTN by SERB, March 01-02, 2019
6. **Travel Grant:** Full Travel Support to attend 9th International Congress on Industrial and Applied Mathematics (ICIAM 2019) held at Valencia, Spain during July 15-19, 2019 by NBHM, DAE, Mumbai

7. **Travel Grant:** Partial Travel Support to attend 10th International Congress on Industrial and Applied Mathematics (ICIAM 2023) held at Tokyo, JAPAN during August 20-25, 2023 by CSIR, New Delhi.

## RESEARCH INTERESTS

I chose to work in Inverse Problems (IP) as it is cross-disciplinary within mathematics and across disciplines, including physical sciences, engineering and biology. Thus, it allows me to apply beautiful and deep mathematics to problems with social and environmental impact. The objectives are to investigate the existence, uniqueness and stability of the solution to the problem that mathematically models a physical phenomenon under investigation, and to develop new convergent and stable algorithms for obtaining the desired solution.

Present Investigation Zone:

- Inverse coefficient problems with boundary data for parabolic partial differential equations and systems using Carleman technique.
- Source identification problems for linear/non-linear parabolic systems. Developing the numerical methods based on adjoint formulations.
- Reconstruction of sources and leading coefficients of parabolic systems by using adjoint and Quasi-solution method.
- Simultaneous identification of coefficients in the parabolic systems by using optimization technique.
- Theoretical and Numerical optimal control problems for Parabolic Partial Differential Equations.

I am planning to explore my ideas in novel areas of research which includes Fractional Optimization Method and Inverse Problems for Fractional Partial Differential Equations.

## RESEARCH LINK

**Mathscinet:** Barani Balan, Natesan.

Source: <https://mathscinet.ams.org/mathscinet/MRAuthorID/858840>

**Scopus:** Barani Balan, N.

Source: <https://www.scopus.com/authid/detail.uri?authorId=36453553000>

**Orcid:** Barani Balan Natesan

Source: <https://orcid.org/0000-0002-6768-3673>

**Web of Science:** Barani Balan N

Source: <https://www.webofscience.com/wos/author/record/AAD-7451-2020>

**Google Scholar:** Barani Balan Natesan

Source: <https://scholar.google.co.in/citations?user=pcXzpasAAAAJ&hl=en>

## RESEARCH PROJECT

Completed : 2

1. Quasi-solution approach to inverse problems for partial differential equations, DST-SERB, 9.96 Lakhs, 2015-18 (3 years)
2. Carleman Estimates and Inverse Problems for System of Partial Differential Equations, NBHM, DAE, 13.51 Lakhs, 2015-18 (3 Years)

## RESEARCH GUIDANCE

Ph.D.:

Completed : 1

Dr A. Arivazhagan (Current Position: Post doctoral Fellow, IIT Gandhi Nagar)

On going: 1

M. Navaneethakrishnan (2019 - till now)

Project Fellows (Funded project): 3

K. Navaneetha Krishnan (PF) (DST-SERB) - Dec. 18, 2015 - Sep. 14, 2016

R. Kamalakkannan (JRF)(NBHM) - Sep. 09, 2016 - Oct. 31, 2017

M. Gunanithi (PF)(DST-SERB)-Nov. 15, 2016 - Oct. 06, 2018

Integrated M.Sc. Project:

Completed : 39      On going: 2 (2023-24)

Internship:

T Narkavi, Basics of real analysis (June 19 - July 16, 2023)

## SCIENTIFIC SERVICE

**Reviewer** for American Mathematical Society (AMS) Mathematical Reviews since 2013  
ZbMath since 2021

**Referee** for the following International Mathematics Journals: Inverse Problems, Journal of Inverse and Ill-posed Problems, The Journal of Analysis, Bulletin of Iranian Mathematical Society (BIMS), Journal of Physics Communications, Journal of Applied Analysis and Computation, Nonlinear Functional Analysis and Applications, Rocky Mountain Journal of Mathematics and so on.

## MEMBERSHIP

Individual Affiliate Member - American Mathematical Society, USA

Life Member - Indian Society of Industrial and Applied Mathematics (ISIAM), INDIA

Life Member - Indian Mathematical Society (IMS), INDIA

## JOURNAL PUBLICATIONS

Total No. of Publications: 21

<b>CE</b>	– Carleman Estimate	<b>CT</b>	– Control Theory
<b>ES</b>	– Existence of Solutions	<b>FEM</b>	– Finite Element Method
<b>IP</b>	– Inverse Problems	<b>NA</b>	– Numerical Analysis
<b>OC</b>	– Optimal Control	<b>OT</b>	– Optimization Technique
<b>QSA</b>	– Quasi Solution Approach		

1. **(IP-CE1)** Uniqueness and Stability in Inverse Parabolic Equations with Memory, Non-linear Analysis: Hybrid Systems, 2 (2008), 1077 -1088 (with K. Sakthivel and K. Balachandran)
2. **(IP-CE2)** Inverse Problems for the Phase Field System with One Observation, Applicable Analysis, 88 (2009) 529-545 (with K. Sakthivel, K. Balachandran and J-H. Kim)
3. **(IP-CE3)** Stability of Diffusion Coefficients in an Inverse Problem for the Lotka-Volterra Competition System, Acta Applicandae Mathematicae, 111 (2010), 129-147 (with K. Sakthivel, K. Balachandran and J-H. Kim)
4. **(IP-CE4)** Reconstruction of Two Time Independent Coefficients in an Inverse Problem for a Phase Field System, Nonlinear Analysis, 72 (2010) 2841-2851 (with K. Sakthivel, K. Balachandran and J-H. Kim)
5. **(IP-OT1)** Inverse Problem for the Reaction Diffusion System by Optimization Method, Applied Mathematical Modelling, 35 (2011) 571-579 (with K. Sakthivel, S. Gnanavel and K. Balachandran)
6. **(IP-QSA1)** Identification of Source terms in the Lotka-Volterra System, Journal of Inverse and Ill-Posed Problems, 20 (2012), 287-312 (with S.Gnanavel and K. Balachandran)
7. **(ES1)** Weak-renormalized solutions for predator-prey system, Applicable Analysis, 90 (2013) 441 - 459 (with L. Shangerganesh and K. Balachandran)
8. **(IP-OT2)** Simultaneous identification of parameters and initial datum of reaction-diffusion system by optimization method, Applied Mathematical Modelling, 37 (2013) 8251-8263 (with S.Gnanavel and K. Balachandran)
9. **(IP-OT3)** Simultaneous Identification of Two Time Independent Coefficients in a Non-linear Phase Field System, Journal of Optimization Theory and Applications, 160 (2014), 992-1008 (with S.Gnanavel and K. Balachandran)
10. **(ES2)** Existence and Uniqueness of Solutions of Degenerate Chemotaxis System, Taiwanese Journal of Mathematics 18 (2014)1605 - 1622 (with L. Shangerganesh and K. Balachandran)
11. **(ES3)** Weak-renormalized solutions for three species competition model in ecology, International Journal of Bio-Mathematics 7 (2014) 1450062 (24 Pages) (with L. Shangerganesh and K. Balachandran)

12. **(IP-CE5)** Identification of Source Terms in a Coupled Age-Structured Population Model with Discontinuous Diffusion Coefficients, *AIMS Mathematics*, 2 (2017) 81-95 (with V. Dinakar and K. Balachandran)
13. **(IP-CE6)** Inverse Problems for Parabolic Equation with discontinuous Coefficients, *Nonautonomous Dynamical System*, 4 (2017) 40-51 (with V. Dinakar and K. Balachandran)
14. **(IP-CT 1)** Inverse Problems and Trajectory Controllability for the Swift-hohenberg Equation, *Indian Journal of Industrial and Applied Mathematics*, 10(2) (2019) 253-269 (with A. Arivazhagan)
15. **(IP-CE7)** Lipschitz Stability of an Inverse Problem for the Kawahara Equation with Damping, *AIMS Mathematics*, 5 (2020), 4529-4545 (with A.Arivazhagan and K. Sakthivel)
16. **(IP-CE8)** Inverse Problems for a Cahn-Hilliard Type System Modelling Tumor Growth, *Applicable Analysis* 101 (2022) 858-890 (with A.Arivazhagan and K. Sakthivel)
17. **(IP-CE9)** Inverse Source Problem for the Generalized Korteweg-de Vries Equation, *Journal of Inverse and Ill-Posed Problems* 29 (2021) 823-848. (with A.Arivazhagan and K. Sakthivel)
18. **(OC1)** Analyzing Lotka Volterra Reaction-Diffusion Model Using Optimization Technique, *Indian Journal of Industrial and Applied Mathematics*, 11 (2020) 174-192 (with K. Navaneetha Krishnan, S. Hemalatha, L. Shangerganesh)
19. **(OC2)** An Optimal Control Problem for Acid-mediated Cancer Invasion Model, *Journal of Applied Nonlinear Dynamics* 12(2) (2023) 339-351 (with M. Navaneetha Krishnan, L. Shangerganesh and J. Manimaran)
20. **(ES4)** Blow-up Phenomena for a sixth-order partial differential equation with a general non-linearity, *Journal of Dynamical and Control Systems* (accepted) (with A. Arivazhagan, L. Shangerganesh, K. Dravid)
21. **(OC3)** Prey-Predator model with an infection in both population: Stability analysis and an optimal control study, *Discontinuity, Nonlinearity and complexity* (with S. Hariharan, K.P. Sreesiva, L. Shangerganesh)

#### JOURNAL COMMUNICATED/UNDER PREPARATION

1. **(IP-OT4)** Inverse Coefficient Problem for Cascade System of Fourth and Second Order Partial Differential Equations (with M. Navaneetha Krishnan and K. Sakthivel)
2. **(CT 1)** Stability of an Inverse Problem for the Swift-Hohenberg Equations (with A. Arivazhagan and K. Sakthivel)
3. **(CT 2)** Trajectory Controllability and a new Unique Continuation Property for the Seventh Order Generalized KdV equation (with A. Arivazhagan and K. Sathivel)
4. **(NA-FEM1)** An Error Analysis of Finite Element Method for Cancer Cell Invasion Model (with Anju Susan Anish, J. Manimaran and L. Shangerganesh)
5. **(NA-FEM2)** An error analysis of a finite element method for HIV/AIDS and tuberculosis coinfection system (with S.V.S.S.R. Jagadiswari, and L. Shangerganesh)

6. (ES5) Estimation on a Lower Bound of Blow-up of Solutions for uPA Diffusion Model  
(with A. Aswini, J. Manimaran and L. Shangerganesh)

## INSTITUTE SERVICE

### **Administrative:**

- Member, 5th Academic Council, CUTN (From June 2022)
- Member, Quarters Allotment Committee, CUTN (From Feb. 2022)
- Member, International student admission committee (From Mar. 2021)
- Member, NAAC Sub-committee (Criterion VII) (From July 2020)
- Member, IQAC, CUTN (From Oct. 2017 to June 2021)
- Coordinator - Department Level NAAC, CUTN (From July 2020)
- Member, Administrative Audit, CUTN (2015-2020)
- Member, Selection Committee (Guest Faculty), 2019-20
- Member, AQAR Committee, CUTN (2018-19)
- Member, Academic Audit, CUTN (2017-18 & 2018-19)
- Coordinator, Science Club, CUTN (From Apr. 2017)
- Member - Sub-committee for NAAC (Admin), CUTN (2016)
- Member - Ph.D. Interview Committee, CUTN (From 2015)
- Member, Rashtria Avishkar Abhiyan, CUTN (From April 2015)
- Member, Student Welfare Committee, CUTN (2015)
- Member - Committee to fixation of Medical Allowance, CUTN (2015)
- Member - Committee to fixation of Travelling Allowance, CUTN (2015)
- In-charge, Department NBHM-Library (From 2013)
- Member - Local Purchase Committee (Selected), CUTN (From 2013)
- Member, Admission committee, CUTN (From 2013)

### **Academic:**

- Member - Board of Studies in Chemistry, CUTN (2015-2018)
- Member - Board of Studies in Mathematics, CUTN (2015-2019) & (From 2022)
- Member - Committee in connection with starting of M.Tech. Programmes, CUTN (2015)
- Coordinator, I M.Sc. Project Coordinator, Department of Mathematics, CUTN (From 2015)
- Member, Research Advisory Committee for 18 Members (10 Members @ CUTN+ 8 Members @ outside University)

- Convener, Research Advisory Committee (2 Members @ CUTN)
- External Examiner, Ph.D./M.Phil Thesis for various Universities and Colleges
- External Examiner, PG Project Evaluation, Central University of Kerala, Kasaragod
- External Examiner, PG/M.Phil./Ph.D. Question Paper Setting and Paper Evaluation for various Universities.

## INVITED/SPECIAL LECTURE DELIVERED

Total number of invited lectures (National/International): 43

1. Partial Differential Equations and Inverse Problems, Faculty Development Programme on advanced Theory and Applications of Mathematics, Coimbatore Institute of Technology, Coimbatore, December 17-23, 2013 (December 21, 2013)
2. A Survey on Inverse Problems for the coupled Parabolic Systems, National Conference on Advances in Differential Equations and Applications, Periyar University, Salem, December 04-05, 2014
3. A Survey on Essential Mathematical Biology, DBT Sponsored "Summer School - Biological Technique", St. Xavier's College(Autonomous), Palayamkottai, June 01-06, 2015 (June 03, 2015)
4. Inverse Coefficient Problems for the Coupled Kuramoto-Sivashinsky Equation with Heat Equation, 8th International Congress on Industrial and Applied Mathematics, Beijing, China, August 10-14, 2015. (poster)
5. Mathematics in Nature, Pedagogical Training Programme for Mathematics Teachers (Rashtriya Avishkar Abhiyan), CUTN, Thiruvarur, January 19, 2016
6. Inverse Problems for system of partial differential equations, National Conference on control and Inverse Problems, CUTN, February 26-27, 2016
7. Differential Equations and its Applications, VIT University, Chennai Campus, September 26, 2016
8. An Introduction to Partial Differential Equations, VIT University, Chennai Campus, September 26, 2016
9. Role of Carleman Estimates in Inverse Problems, Conference on Computational and Theoretical Partial Differential Equation (CCT-PDE 2016), NIT Goa, October 05-07, 2016
10. Inverse Problems: A brief remark, National Conference on Recent Advances in Theoretical and Computational Methods for Partial Differential Equations, Dr N.G.P Arts & Science College, Coimbatore, January 06-07, 2017
11. Series of lectures delivered in the topic "Heat and Wave equation" in Advanced workshop on Partial differential Equations and Applications, Central University of Tamil Nadu, Thiruvarur, May 29 - June 11, 2017
12. Series of lectures delivered in the topic "Introduction to analysis" , One day workshop on basic concepts of real analysis at Dr N.G.P Arts & Science College, Coimbatore, August 16, 2017

13. Stability conditions for numerical partial differential equations, VIT University, Chennai Campus, October 27, 2017
14. Series of lectures in the topic "Research Methodology", Intellectual Property Rights cell, Central University of Tamil Nadu, 2017-18
15. Mathematical Modelling, PSGR Krishnammal College for Women, Coimbatore, February 07, 2018
16. Differential Equations and its Applications in Mathematical Biology, National Seminar on Biomathematics, PSG College of Arts and Science, Coimbatore, March 19, 2018
17. Lectures on "Partial differential equations" delivered in "National Workshop on Partial Differential Equations", Periyar University, Salem, March 23-25, 2018
18. Mathematical Biology, One day National Seminar on Enhanced Trends in Mathematics, R.A.M. College, Thiruvavur, August 29, 2018
19. Inverse and Ill-Posed Problems, Periyar University, Salem, December 14, 2018
20. Jacques Hadamard's View on Mathematical Models, National Seminar on Recent Trends in Pure and Applied Mathematics, Selvam College of Technology, Namakkal, March 04, 2019
21. Inverse Problems for Partial Differential Equations: Carleman Estimates, National Conference on Differential Equations and Dynamical Systems, NIT Karaikkal, Pondicherry, April 05-06, 2019
22. Ordinary and Partial Differential Equations, Faculty Development Programme on Recent Advances in Mathematics held at Dr N.G.P. Arts and Science College, Coimbatore, June 04, 2019
23. Controllability and Stability of an Inverse Problem for the Coefficient in a Swift-Hohenberg Equations, International congress on Industrial and Applied Mathematics (ICIAM 2019), Valencia, Spain, July 15-19, 2019
24. Stability of an Inverse Problems for the Tumor Growth Model, "Symposium of PDEs and Applications" at "International conference in Conjunction with 15th Biennial Conference of ISIAM", Bharathiar University, Coimbatore, December 05-07, 2019
25. Introduction to the second order linear parabolic differential equations, Advanced Workshop on Partial Differential Equations and Applications, Central University of Kerala, Kasaragod, December 16-30, 2019 (December 26, 2019)
26. Existence and Uniqueness of weak solution of the second order linear parabolic differential equations, Advanced Workshop on Partial Differential Equations and Applications, Central University of Kerala, Kasaragod, December 16-30, 2019 (December 27, 2019)
27. Regularity results for weak solution of the second order linear parabolic differential equations, Advanced Workshop on Partial Differential Equations and Applications, Central University of Kerala, Kasaragod, December 16-30, 2019 (December 28, 2019) (Two session)



28. Harnack inequality for second order linear parabolic differential equations, Advanced Workshop on Partial Differential Equations and Applications, Central University of Kerala, Kasaragod, December 16-30, 2019 (December 29, 2019)
29. Carleman Estimates & Inverse Problems for Partial Differential Equations, National Conference on Partial Differential Equations and Applications held at Periyar University, Salem, March 05-06, 2020
30. Inverse and Ill-posed Problems, International Webinar Series on Advances in Mathematics, Tata Institute of Social Sciences, Tuljapur, June 22-27, 2020 (June 23, 2020)
31. Inverse and optimization Problems, International Faculty Development Programme on "Astute-Efflux Trends in Mathematics", SNS College of Engineering, Coimbatore, July 02-07, 2020 (July 06, 2020)
32. Well posed Problem: An Overview, A Live Webinar on Applied Mathematics, Anna University, Tiruchirappalli, July 15, 2020
33. Mathematical Modelling, Two days webinar on "Mathematical Modelling and Problem solving using SageMath", Venkateswara College of Engineering, Sriperumpudur, August 04, 2020
34. Mathematical Models in Biology, Two days International webinar on Mathematical and Computational Biology, Department of Mathematics, RVS College of Arts and Science, Coimbatore, November 24, 2020
35. Diffuse Interface Model of Multi-species Tumor Growth, National Conference on Mathematical Theory of Control (NCMTC 2020), National Institute of Technology Puducherry, Karaikal, December 10-12, 2020
36. A Walk through Differential Equations, TEQUIP III Sponsored One day Seminar on Applications of Differential Equations, Coimbatore Institute of Technology, Coimbatore, March 12, 2021.
37. Basic Analysis I, Six days National Level Webinar cum Workshop on Calculus, Algebra and Analysis, RVS College of Arts and Science, Coimbatore, July 08, 2021.
38. Basic Analysis II, Six days National Level Webinar cum Workshop on Calculus, Algebra and Analysis, RVS College of Arts and Science, Coimbatore, July 10, 2021.
39. Introduction to Inverse and Ill Posed Problems and Its Applications, Mathematics Colloquium, Central University of Kerala, Kasaragod, August 13, 2021
40. Essence of Optimal Control and Inverse Problems in Biological Models, International e-conference on Number Theory and Differential Equations (ICND - 2021), Central University of Karnataka, Kalburagi, December 20-24, 2021
41. Contribution of Indian Mathematicians, National Mathematics Day Celebration, Department of Education, Central University of Tamil Nadu, December 21, 2022
42. Optimal Control and Inverse Problems, Two days workshop on "Recent Advancements in Systems and Control Theory", Department of Applied Mathematics, Bharathiar University, Coimbatore, March 30-31, 2023

43. Inverse Problems for Mathematical Oncology Model, National Conference on Recent Advances in Industrial and Applied Mathematics (RAIAM 2023), Department of Mathematics, Periyar University, Salem, July 27–28, 2023.

## EVENTS ORGANIZED

1. National Mathematics Day - 2012 at Central University of Tamil Nadu, Thiruvapur, December 22, 2012 (Co-organizer), funded by CUTN
2. Workshop on Differential Equations and Its Applications, at Central University of Tamil Nadu, Thiruvapur, December 28-29, 2012 (organizer), funded by CUTN
3. Crash Course on Numerical Methods for Ordinary Differential Equations at Central University of Tamil Nadu, Thiruvapur, April 25-27, 2013 (Co-organizer), funded by CUTN
4. Parents-Student -Faculty Meeting at Central University of Tamil Nadu, Thiruvapur, April 05, 2014 (Co-organizer), funded by CUTN
5. National Conference on control and Inverse Problems at Central University of Tamil Nadu, Thiruvapur, February 26-27, 2016 (Organizer) funded by National Board for Higher Mathematics (NBHM), Department of Atomic Energy (DAE)
6. National Workshop on Advanced Analysis and Differential Equations at Periyar University, Salem, June 09-17, 2016 (Organizing Committee Member) funded by NBHM and INSA
7. Advanced workshop on Partial differential Equations and Applications at Central University of Tamil Nadu, Thiruvapur, May 29 - June 11, 2017 (Organizer) funded by NBHM
8. SCIENTIFIKA by Science Club of CUTN at Central University of Tamil Nadu, Thiruvapur, Mar 05, 2018 (Organizer), funded by CUTN.
9. National Science Day Lecture by Prof. Klass Petterson at Central University of Tamil Nadu, Thiruvapur, March 01, 2019 (Organizer), funded by CUTN
10. Second National Conference on Control and Inverse Problems at Central University of Tamil Nadu, Thiruvapur, March 01-02, 2019 (Organizer) funded by Science and Engineering Research Board (SERB)
11. Third National Conference on Control and Inverse Problems (online), February 25-26, 2022 (Organizer) funded by CUTN, CU Kerala and Periyar University

## EVENTS PARTICIPATED

1. National Conference on Partial Differential Equations and Applications Bharathiar University, Coimbatore, March 10-11, 2005 (National Level)
2. National Conference on Differential Equations and Applications Periyar University, Salem, September 28-29, 2006. (National Level)
3. National Conference on Applications of Partial Differential Equations Bharathiar University, Coimbatore, January 24-25, 2007. (National Level)

4. Lecture Series on Navier-Stokes Equations Indian Institute of Technology Bombay, December 30-January 07, 2007. (International Level)
5. Workshop on Nonlinear Control Systems National Institute of Technology, Tiruchirappalli, February 21, 2008. (International Level)
6. Symposium on Nonlinear Evolution Equations, Indian Institute of Science, Bangalore, April 18-19, 2008. (International Level)
7. 10th International Conference on Nonlinear Functional Analysis and Applications Kyungnum Univesity, Masan, South Korea, July 27-31, 2009. (International Level)
8. International Conference on Control and Inverse Problems, Indian Institute of Science, Bangalore, December 16-18, 2009. (International Level)
9. National Conference on Advances in Differential Equations and Applications Periyar University, Salem, October 07-08, 2010. (National Level)
10. Special Lectures on Navier-Stokes Equations: Solvability, Control and Stochastic Analysis Bharathiar University, Coimbatore, February 14-18, 2011. (International Level)
11. Special Lectures on Large Deviations Theory: Connections to Control Theory, Fluid Dynamics, Nonlinear PDE and Statistics Bharathiar University, Coimbatore, February 16-22, 2012. (International Level)
12. Special Lectures on Mathematics of Turbulence, Random Waves and Quantum Fields Bharathiar University, Coimbatore, July 16-27, 2012. (International Level)
13. Teacher Participant in Mini MTTS Periyar University, Salem, June 23 -July 4, 2014. (National Level)
14. National Conference on Advances in Differential Equations and Applications Periyar University, Salem, December 04-05, 2014. (National Level)
15. 8th International Congress on Industrial and Applied Mathematics Beijing, China, August 10-14, 2015. (International Level)
16. Conference on Computational and Theoretical Partial Differential Equation NIT Goa, October 5-7, 2016. (National Level)
17. National Conference on Recent Advances in Theoretical and Computational Methods for Partial Differential Equations Dr N.G. P Arts & Science College, Coimbatore, February 6-7. 2017. (National Level)
18. International IFCAM Conference on Nonlinear PDEs, TIFR-CAM, Bengaluru, March 28-29, 2017. (International Level)
19. International Conference & 14th Biennial Conference of Indian society of Industrial and Applied Mathematics Guru Nanak Dev University, Amristsar, February 2-4, 2018. (International Level)
20. International Symposium on computational Science and its Applications, Sharda University, Greater Noida, February 5-6, 2018. (International Level)
21. Discussion Meeting on Teaching of Differential Equations in India, Indian Academy of Sciences (IAS), Bengaluru, February 26-28, 2018. (National Level)

22. National Conference on Control and Inverse Problems, CUTN, March 01-02, 2019. (National Level)
23. National Conference on Differential Equations and Dynamical Systems, NIT Karaikkal, Pondicherry, April 05-06, 2019. (National Level)
24. National Conference on Stochastic Differential Equations and Applications, Indian Institute of Space Science and Technology (IIST), Trivandrum, June 06-07, 2019. (National Level)
25. International congress on Industrial and Applied Mathematics (ICIAM 2019), Valencia, Spain July 15-19, 2019. (International Level)
26. International Conference in Conjunction with 15th Biennial Conference of ISIAM, Bharathiar University, Coimbatore, December 05-07, 2019. (International Level)
27. National Conference on Recent Advances in Industrial and Applied Mathematics (RAIAM 2023), Department of Mathematics, Periyar University, Salem, July 27–28, 2023. (National Level)

#### ORIENTATION/REFRESHER COURSES ATTENDED

1. Orientation Programme, UGC-HRDC, Bharathiar University, Coimbatore, Tamil Nadu, November 18, 2015 to December 15, 2015.
2. Refresher Course in Applied Mathematics and Statistics, UGC-HRDC, Bharathiar University, Coimbatore, Tamil Nadu, July 05, 2017 to July 25, 2017.
3. Refresher Course in Mathematics & Statistics, UGC-HRDC, Bharathidasan University, Tiruchirappalli, Tamil Nadu, November 25, 2020 to December 08, 2020.
4. Refresher Course in Mathematical Science, UGC-HRDC, University of Calicut, Malappuram, October 20, 2021 to November 02, 2021.

