DR. GARGI TRIVEDI

ASSISTANT PROFESSOR, APPLIED MATHEMATICS

CONTACT

9426149522

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Vadaoadra,Gujarat,India

www.LinkedIn.com/

AREAS OF EXPERTISE

- Image Fusion
- Machine Learning
- Numerical Methods
- Differential Equations
- Fractional Calculus

CORE SKILLS

- Critical Thinking
- Research & Analysis
- Student Mentoring
- Multitasking
- Adaptability
- Programming (C, Python, Java, SQL,

ACHIEVEMENTS

- 1st Rank in M.Sc.
- Excellence in Exam Duty Award
- Best Cadet Award (NCC)
- Best Paper Award
- Best Poster Award

SUMMARY

Dedicated academic professional with strong expertise in Applied Mathematics, specializing in image fusion, numerical analysis, differential equations, and machine learning. Experienced in teaching, research, mentoring, and academic administration, with 35+ publications in reputed international journals. Passionate about integrating advanced

EDUCATION

Ph.D. (Mathematics)
The Charutar Vidyamandal University, 2024

M.Sc. Mathematics — 74.18%
Bhavnagar University, 2010

B.Ed. Math/Sci. — 82.45%
Bhavnagar University, 2011

P.G.D.C.A. — 57.83%
Bhavnagar University, 2009

B.Sc. Mathematics — 73.66%
Bhavnagar University, 2007

H.S.C Science — 46.31% | 2005
Gujarat Secondary and Higher Secondary Education Borad

S.S.C — 71.71% | 2003

ROFESSIONAL EXPERIENCE

Assistant Professor

Department of Applied Mathematics, MSU Baroda| 2022 – Present

- Teaching UG/PG Applied/Financial Mathematics courses.
- Supervising M.Sc. and PGDCA projects.
- Conducting labs in Python, MATLAB, C, Java, SQL, UNIX, HTML.
- Member of NAAC, NBA, GCAS, admissions & library committees.

Teaching Assistant

Department of Mathematics, MSU Baroda | 2015 – 2020

- Teaching UG/PG Applied Mathematics courses.
- Conducted tutorials, evaluations, and student guidance.
- Supported departmental academics and administration.

🗣️ Lecturer

Swami Sahajanand College of Commerce & Management, Bhavnagar University| 2011 – 2015

- Taught Mathematics & Statistics to BBA, BCA, B. Com, B.Sc. IT.
- Developed lesson plans and supported student projects.

📓 Additional Teaching Experience

- **Visiting Lecturer**, Sir P.P. Institute of Science, B.Sc. Program, Bhavnagar University |**2010 –2012**
- **Visiting Lecturer**, Shree Maruti Vidya Mandir, Bhavnagar University **& BBA Programs, 2011**
- **Visiting Faculty**, Department of BBA, BCA MSU Baroda |**BBA and BCA Program, 2015 – 2020**

💻 ACADEMIC PRESENTATIONS & WORKSHOPS

📢 **Contributed** Talk

◇ Wavelet-Sparse Convolutional Fusion (WSCF)

National Seminar on Number Theory and Lie Algebra (NSNTLA-2025), Department of Mathematics, Sambalpur University

Oral Presentation | Feb 27–28, 2025

🛠️ **Hands-On Workshop / Training**

◇ Introduction to R Programming: From Basics to Data Analysis

National Seminar on Mathematical Innovations in Industry: IoT, Automation, and Control Systems, Department of Applied Science & Humanities, Parul University

Hand on Seminar | NOV 7, 2025

✍Publications →

BOOK CHAPTERS

1. **Trivedi, Gargi (2024),MDWT: A Modified Discrete Wavelet Transformation-Based Algorithm for Image Fusion.**
Beyond Signals – Exploring Revolutionary Fourier Transform Applications, IntechOpen, Chapter 6.
ISBN: 978-1-83634-241-0 | **DOI:** https://doi.org/10.5772/intechopen.1006477

2. Trivedi, Gargi (2026),Adaptive PDE-Constrained Neural Fusion (APCNF) Model.
Differential Equations in the Era of Advanced Computational Science, Willey, Chapter 6.
ISBN: 978-1-83634-241-0 |**DOI:** https://doi.org/10.5772/intechopen.1006477

3. Shah, V.; Anukiruthika, K.; Sharma, J.; Muthukumar, P.; & Trivedi, Gargi (2026), Semi-Analytical and Numerical Approaches to Trajectory Controllability of Conformable Fractional Systems.
Semi-Analytical and Numerical Approximations of Fractional Partial Differential Equations. Apple Academic Press, Chapter 8
Hardback ISBN: **978-1-77964-571-5 |** eBook ISBN: **978-1-77964-572-2 |**

RESEARCH PAPER PUBLICATION

1. **Trivedi, Gargi (2025).** MNSCT: A Novel Modified NSCT-Based Algorithm for Enhanced Medical Image Fusion
Medical Imaging Process & Technology, **Vol. 8(1), pp. 1–15, Feb 2025**
ISSN: **2578-160X** • DOI: **https://doi.org/10.24294/mipt10655**

2. **Trivedi, Gargi (2025).** Mathematical Modeling and Numerical Analysis of Diffusion Processes in Image Processing
Journal of Applied Math., **Vol. 3(2), pp. 1–15, March 2025**
ISSN: **2972-4805** • DOI: **https://doi.org/10.59400/jam2736**

3. **Trivedi, Gargi (2025).** Adaptive Finite Difference Image Fusion (AFDIF): A Novel PDE-Based Approach
Mathematical Methods in the Applied Sciences, **Vol. 0, pp. 1–19, Nov 2025**
DOI: **https://doi.org/10.1002/mma.70297**
SCIE (Wiley) —Scopus

4. **Trivedi, Gargi J. & Sanghvi, Rajesh C. (2022).** Medical Image Fusion Using CNN with Automated Pooling, *Indian Journal of Science and Technology*, **Vol. 15(42), pp. 2267–2274, Nov 2022 ISSN: 0974-5645 • DOI: 10.17485/ijst/v15i42.1812 WOS**

5. **Trivedi, Gargi J. & Sanghvi, Rajesh C. (2023).** Novel Approach to Multi-Modal Image Fusion using Modified Convolutional Layers, *Journal of Innovative Image Processing*, **Vol. 5(3), pp. 229–252, Sep 2023 ISSN: 2582-4252** • DOI: **https://doi.org/10.36548/jiip.2023.3.002**
6. **Trivedi, Gargi J. & Sanghvi, Rajesh C. (2023).** Optimizing Image Fusion Using Modified Principal Component Analysis and Adaptive Weighting Scheme, *International Journal of Advanced Networking and Applications*, **Vol. 15(1), pp. 5769–5774, Jul 2023 ISSN: 0975-0290 •DOI: https://doi.org/10.35444/IJANA.2023.15103**
7. **Trivedi, Gargi J. & Sanghvi, Rajesh C. (2023).** FuseSharp: A Multi-Image Focus Fusion Method Using DWT and Unsharp Masking*, Journal of Applied Mathematics & Informatics*, **Vol. 41(5), pp. 1115–1128, Sep 2023 ISSN: 2234-8417** • DOI: **Https://doi.org/10.14317/jami.2023.1115 Scopus**

8. **Trivedi, Gargi J. & Sanghvi, Rajesh C. (2022).** Medical Image Fusion Using CNN with Automated Pooling
Indian Journal of Science and Technology, **Vol. 15(42), pp. 2267–2274, Nov 2022**
ISSN: 0974-5645 • DOI: 10.17485/ijst/v15i42.1812
WOS

9. **Trivedi, Gargi J. & Sanghvi, Rajesh C. (2023).** Novel Approach to Multi-Modal Image Fusion using Modified Convolutional Layers
Journal of Innovative Image Processing, **Vol. 5(3), pp. 229–252, Sep 2023**
ISSN: 2582-4252 • DOI: https://doi.org/10.36548/jiip.2023.3.002

10. **Trivedi, Gargi J. & Sanghvi, Rajesh C. (2023).** Optimizing Image Fusion Using Modified Principal Component Analysis and Adaptive Weighting Scheme
International Journal of Advanced Networking and Applications, **Vol. 15(1), pp. 5769–5774, Jul 2023**
ISSN: 0975-0290 • DOI: https://doi.org/10.35444/IJANA.2023.15103

11. **Trivedi, Gargi J. & Sanghvi, Rajesh C. (2023).** FuseSharp: A Multi-Image Focus Fusion Method Using DWT and Unsharp Masking
Journal of Applied Mathematics & Informatics, **Vol. 41(5), pp. 1115–1128, Sep 2023**
ISSN: 2234-8417 • DOI: https://doi.org/10.14317/jami.2023.1115
Scopus

12. **Trivedi, Gargi J. & Sanghvi, Rajesh C. (2023).** A New Approach for Multimodal Medical Image Fusion using PDE-Based Technique
Suranaree Journal of Science and Technology, **Vol. 30(4), pp. 030132(1–7), Dec 2023**
ISSN: 2587-0009 • DOI: https://doi.org/10.55766/sujst-2023-04-e0843
Scopus —WOS

13. **Trivedi, Gargi J. & Sanghvi, Rajesh C. (2023).** Hybrid Model for Infrared and Visible Image Fusion
Annals of the Faculty of Engineering Hunedoara – International Journal of Engineering, **Vol. 21(3), pp. 167–173, Aug 2023**
ISSN: 2601-2332 • DOI: — (ProQuest link provided)

14. **Trivedi, Gargi J. & Sanghvi, Rajesh C. (2023).** MosaicFusion: Merging Modalities with PDE and DCT
Journal of Applied and Pure Mathematics, **Vol. 5(5–6), pp. 389–406, Dec 2023**
ISSN: 2636-1612 • DOI: https://doi.org/10.23091/japm.2023.389

15. **Trivedi, Gargi J. & Sanghvi, Rajesh C. (2024).** Automated Multimodal Fusion with PDE Preprocessing and Learnable Convolutional Pools
ADBU Journal of Engineering Technology, **Vol. 13(1), pp. 0130104066, Jan 2024,ISSN: 2348-7305**
— UGC care

16. **Trivedi, Gargi J. & Sanghvi, Rajesh C. (2023).** MSCNN: Multi-Sensor Image Fusion Using Dual Channel CNN
Mathematica Applicanda, **Vol. 51(2), pp. 165–189, 2023**
ISSN: 1730-2668 • DOI: 10.14708/ma.v51i2.7204
Scopus

17. **Trivedi, Gargi J. & Sanghvi, Rajesh C. (2025).** Novel Algorithm for Multifocus Image Fusion using CNN and PDE Integration
Surveys in Mathematics and its Applications, **Vol. 19, pp. 179–195**
ISSN: 1842-6298 • DOI: https://www.utgjiu.ro/math/sma/v19/a19_11.html
Scopus

18. **Trivedi, Gargi J. & Sanghvi, Rajesh C. (2024).** Infrared and Visible Image Fusion Using Multi-scale Decomposition and PDEs
International Journal of Applied and Computational Mathematics, **Vol. 10:133, pp. 1–16**
ISSN: 2199-5796 • DOI: https://doi.org/10.1007/s40819-024-01768-8
SCIE (Springer) —Scopus

19. **Trivedi, Gargi; Shah, Vishant; Sharma, Jaita; & Sanghvi, Rajesh C. (2023).**
On Solution of Non-Instantaneous Impulsive Hilfer Fractional Integro-Differential Evolution System
Mathematica Applicanda, **Vol. 51(1), pp. 33–50, 2023**
ISSN: 1730-2668 • DOI: 10.14708/ma.v51i1.7167
Scopus

20. **Sharma, Tejas; Pathak, Shreekant; Trivedi, Gargi; & Sanghvi, Rajesh C. (2023).**
Flow Modelling in Porous Medium Applying Numerical Techniques: A Comparative Analysis
Recent Research Reviews Journal, **Vol. 2(2), pp. 288–304, Dec 2023**
ISSN: 2583-7079 • DOI: https://doi.org/10.36548/rrrj.2023.2.004

21. **Sharma, Tejas; Pathak, Shreekant; & Trivedi, Gargi (2023).**
Comparative Study of Crank-Nicolson and Modified Crank-Nicolson Methods for Linear PDEs
Indian Journal of Science and Technology, **Vol. 17(10), pp. 924–931**

ISSN: 0974-5645 • DOI: https://doi.org/10.17485/IJST/v17i10.1776
🔗 WOS

22. Sharma, Tejas; Pathak, Shreekant; & Trivedi, Gargi (2023).
Numerical Modelling Through Porous Media: Modified Crank–Nicolson Approach to Burger's Equation
Journal of Advanced Zoology, Vol. 44(S8), pp. 363–371, Dec 2023
ISSN: 0253-7214 • DOI: https://doi.org/10.53555/jaz.v44iS8.4098
🔗 WOS

23. Sharma, Tejas; Trivedi, Gargi; Shah, Vishant; & Pathak, Shreekant (2024).
Numerical Solution of One-Dimensional Dispersion Equation in Homogeneous Porous Medium Using Modified Finite Element Method
Journal of Computational and Engineering Mathematics, Vol. 11(3), pp. 16–27, Oct 2024
ISSN: 2413-3574 • DOI: 10.14529/jcem240302

24. Shah, Vishant; Sharma, Jaita; Samei, M. E.; & Trivedi, Gargi (2024).
Trajectory Controllability of Second-Order Semilinear Systems Using a Functional Analytic Approach
Journal of Computational and Engineering Mathematics, Vol. 11(4), pp. 22–32, Dec 2024
ISSN: 2413-3574 • DOI: 10.14529/jcem240403

25. Malviya, Ghanshyam; Sharma, Jaita; Shah, Vishant; & Trivedi, Gargi (2025).
Mathematical Modelling and Controllability Analysis of Fractional-Order Coal Mill Pulverizer Model
Advances in Differential Equations and Control Processes, Vol. 32(1), pp. 1–13, Mar 2025
ISSN: 3048-734X • DOI: https://doi.org/10.59400/adecp2075
🔗 —SCOPUS 📊 —WOS

26. Shah, Vishant; Anukiruthika, K.; Muthukumar, P.; Sharma, Jaita; & Trivedi, Gargi (2025).
Existence and Trajectory Controllability for Conformable Fractional Evolution Systems
Malaya Journal of Matematik, Vol. 13(1), pp. 63–74, Feb 2025
ISSN: 2321-5666 • DOI: http://doi.org/10.26637/mjm1301/008

27. Shah, Vishant; Trivedi, Gargi; Sharma, Jaita; & Patel, Prakash (2025).
On Controllability of Semilinear Generalized Impulsive Systems on Finite-Dimensional Space
Differential Equations and Their Applications, Vol. 17(2), pp. 65–84, Sep 2025
ISSN: 1848-9605 • DOI: http://dx.doi.org/10.7153/dea-2025-17-05
🔗 —Scopus 📊 —WOS

28. Shah, Vishant; Sharma, Neetu; Trivedi, Gargi; Sharma, Jaita; & Vaghela, Vimalkumar (2025).
Exact Controllability of Fractional Impulsive Systems

Ural Mathematical Journal, Vol. 11(2), pp. — , Dec 2025
ISSN: 2414-3952 • DOI: —
🔗 —Scopus 📊 —WOS

29. Sharma, Tejas; Pathak, Shreekant; Trivedi, Gargi; Shah, Vishant; Patel, Bhavyata; & Shah, Trupti (2026).
Numerical Solution of Fractional-Order Nonlinear Partial Differential Equation
Journal of Applied Analysis and Computation, Vol. 16(2), pp. 779–793, Apr 2026
ISSN: 2156-907X • DOI: 10.11948/20250026
🔗 —Scopus 📊 —WOS

30. Shah, Ravi; Raj, Heenaben; & Trivedi, Gargi (2025).
Transformation of Nonlinear PDEs to Linear Forms for MHD Flow of Non-Newtonian Fluids over Stretching/Shrinking Surfaces
International Journal of Applied Mathematics, Vol. 38(1s), 2025
ISSN: 1314-8060 • DOI: https://doi.org/10.12732/ijam.v38i1s.53
🔗 Scopus

31. Shah, Ravi; Raj, Heenaben; & Trivedi, Gargi (2025).
Fractional-Order Williamson Fluid Flow with Slip and Cross-Diffusion Over a Variable-Thickness Sheet
Communications in Mathematics and Applications, **Vol. 16(3), pp. — , Dec 2025**
ISSN: 0975-8607 • DOI: —
🔗 Scopus

32. *Patel, Bhavyata; Trivedi, Gargi; & Shah, Trupti (2025).*
Novel Finite Element Method with Adaptive Mesh Refinement for Nonlinear Fractional-Order Differential Equations
Surveys in Mathematics and its Applications, Vol. 20, Dec 2025
ISSN: 1842-6298 • DOI: https://www.utgjiu.ro/math/sma/v20/.html
🔗 Scopus

33. Shah, Ravi; Raj, Heenaben; & Trivedi, Gargi (2025).
Lie Symmetry-Based Reduction and Numerical Analysis of Boundary Value Problems
Journal of Applied Math., 2025
ISSN: 2972-4805 • DOI: —

RESEARCH PAPER PRESENTATIONS (CONFERENCES & SEMINARS)

International Conference Presentations

1. Trivedi, Gargi (2021). A Review of Machine Learning in Various Image Fusion Techniques
   Presented at International Conference on Recent Developments in Mathematics and Mathematical Sciences (ICRDMMS 2021)
   Calcutta Mathematical Society • 9–11 Dec 2021
   International • Calcutta Maths Society

2. Trivedi, Gargi (2022). Design of Novel Multimodal Image Fusion Technique based on PDE
   International Conference on Applied Mathematical Sciences (ICAMS-2022) • Hybrid Mode
   Gujarat University & Parul University • 12–13 Nov 2022
   Best Paper Award
   International • PDE / Image Fusion

3. Trivedi, Gargi (2023). Novel Algorithm for Multifocus Image Fusion: CNN–PDE Integration
   5th International Conference on Recent Trends in Science and Technology (ICRTST-2023)
   Maa Shkumbari Trust, Greater Noida • 4–5 Mar 2023
   International • CNN / PDE Fusion

4. Trivedi, Gargi (2024). MDWT: A Modified Discrete Wavelet Transform Algorithm for Image Fusion
   6th International Conference on Emerging Trends on Sustainable Approaches in Science & Technology (ICETSAST-2024)
   Greater Noida • 24–25 Feb 2024
   International • MDWT Fusion

5. Trivedi, Gargi (2024). Multi-Modal Image Fusion via Non-Instantaneous Impulsive Hilfer Fractional Integro-Differential Evolution System
   5th International Conference on Mathematics, Engineering & Management Sciences
   UPES Dehradun • 13–14 Dec 2024
   International • Fractional Models

IN National Conference & Seminar Presentations

6. Trivedi, Gargi (2023). Fusing Medical Images with Convolutional Neural Networks
   National Conference on Computational and Characterizing Techniques in Engineering and Sciences (CCTES-23)
   REC Ambedkar Nagar, UP • 27–28 Feb 2023
   National • CNN-Fusion

7. 📄 Trivedi, Gargi (2023). Dual-Stream CNN for MRI–CT Image Fusion
   National Seminar on Applied Mathematics in Science & Technology
   University of Calcutta • 21–23 Mar 2023
   🔗 National • 🧠 MRI/CT Fusion

8. 📄 Trivedi, Gargi (2023). Advancing Medical Image Fusion: Multi-Scale Framework using Dual PDEs
   National Conference on Mathematics and Applied Sciences
   New Panvel Autonomous University, Maharashtra • 22 Dec 2023
   🔗 National • 🔬 Multi-Scale PDEs

9. 📄 Trivedi, Gargi (2025). PDE-DeepFuse: PDE Preprocessing with Deep Learning & PCA-Based Fusion
   National Seminar on Number Theory and Lie Algebra (NSNTLA-2025)
   Sambalpur University, Odisha • 27–28 Feb 2025
   🔗 National • 🤖🎞️ PDE + DL Fusion

10. 📄 Trivedi, Gargi (2014). Impact of Linear Programming in Human Resource
    National Conference: The Role of Indian Industry in Changing Era
    Smt. S. H. Gajera MBA College, Amreli • in collaboration with Gujarat Technological University, Ahmedabad • 6 Apr 2014
    🔗 National • 📊 Applied Optimization / HR Analytics

🖼️ Poster Presentations

1. Poster Presentation on “Hybrid model for Multisensor image fusion” during the Research Week organized by CVM University at NVPAS on 23 December 2022.
2. Poster Presentation on “Multi-Modal Medical Image Fusion of Brain CT and MRI using Convolutional Neural Networks and Discrete Wavelet Transform” during the Research Week organized by CVM University on 10 January 2024. (Received Best Poster Award)

🎓 Refresher Courses

Refresher Course on Analysis and its Applications, Department of Mathematics, MSU Baroda, 06–18 June 2016.

🎤 Seminars / Webinars / Conferences Attended

1. Two-day National Seminar on “R Studio and Data Analysis”, CSSR & SRRM College, Andhra Pradesh, 13–14 June 2023.

2. International Webinar on “Application of Graph Theory”, Shri H.D. Devegowda College, Karnataka, 27 January 2023.
3. 2nd Southeast Asian Virtual Study Group Meeting on Industrial Problems, MSU Baroda, 15–19 November 2021.
4. Lecture on “Analysis of Cancer Cells with Artificial Intelligence and Human Intelligence” by Dr. C. C. Reyes Aldasor, University of London (UK) on 21 January 2022, MSU Baroda.
5. Lecture on “The influence of humans on climate” by Prof. (Dr.) Atul K. Jain, University of Illinois, USA on 29 January 2022, MSU Baroda.
6. State-Level Conference “XXVI Gujarat Science Congress 2012”, MSU Baroda & Gujarat Science Academy, 26 Feb 2012.
7. National Conference BSFAST – “Basic Sciences as Foundation of Applied Sciences and Technology”, Sir P.P. Institute of Science, Bhavnagar, 20 Feb 2012.

🛠 Workshops Attended

1. National Workshop on “Mathematical Tools – MATLAB and Mathematica”, VIT Chennai, 30–31 January 2023.
2. National Workshop on “Analytical Tools of Research: jamovi”, GCET University, 26–28 June 2023.
3. Workshop on “Primary Census Abstract, Census 2011”, Directorate of Census Operations & M.K. Bhavnagar University, 1 February 2014.
4. Lecture Workshop on “Science Academies and Topology”, MSU Baroda (Sponsored by IASc, INSA, NASc), 1–3 August 2015.
5. National Workshop on “Problem Solving Techniques in Mathematics – III”, MSU Baroda, 08–12 December 2018.

🏫 Faculty Development Programs (FDP) / STTP / Teacher Training

1. FDP jointly organized by Swami Sahjanand College of Commerce & Management and M.K. Bhavnagar University, 27 March – 2 April 2014.
2. One-week National-Level FDP by Swami Sahajanand College of Commerce & Management & M.K. Bhavnagar University, 27 March – 2 April 2014.
3. Two-day FDP on “Current Scenario in Applied Mathematics”, Hindustan College of Engineering & Technology, Coimbatore, 23–24, 2021.
4. One-Week National-Level FDP “Embracing the Future: Innovation in Education, Technology and Research”, Department of CSE, MCET Hyderabad, 3–7 February 2025.
5. Five-day FDP on “Role of Mathematics in Machine Learning”, SRM Institute of Science & Technology, 20–24 February 2023.
   UGC MM-TTP Certificate: Completed One-Week FDP on “Cryptography and Information

Security", 10–16 July 2025, Hansraj College (University of Delhi) under Malaviya Mission Teacher Training Programme.