

SHRAVANI NAKIDI

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RESEARCH INTERESTS

Development and analysis of finite element-based numerical methods for PDEs; *a posteriori* error analysis for parabolic PDEs with random input data and parabolic integro-differential equations, discontinuous Galerkin methods, adaptive algorithms, uncertainty quantification, scientific computing and machine-learning techniques for PDEs.

EDUCATION

Birla Institute of Technology and Science Pilani, Hyderabad Campus Hyderabad, India
PhD in Mathematics 08/2019 – 04/2025
Thesis Title: *A posteriori* error analysis of parabolic PDE with small randomness in the Robin boundary condition
Thesis advisors: Prof. Gujji Murali Mohan Reddy and Prof. Michael Vynnycky
External Examiner: Prof. Yan Ping Lin

National Institute of Technology Warangal Warangal, India
Master of Science (Applied Mathematics) 08/2015 – 05/2017

Aurora College (affiliated to Osmania University) Hyderabad, India
Bachelor of Science in Mathematics, Statistics, and Computer Science 08/2011 – 06/2014

ACADEMIC EMPLOYMENT AND RESEARCH VISITS

The Fields Institute for Research in Mathematical Sciences Toronto, Canada
Long-term Visitor (Incoming) 08/2026 – 10/2026
Invited to participate in the Thematic Program on Quantum Algorithms for Differential Equations

Work Integrated Learning Programmes, BITS Pilani Hyderabad, India
Visiting Faculty, Department of Core Engineering 03/2025 – Present

PUBLICATIONS

Submitted/Working Papers

1. **Parametric elliptic reconstructions and a posteriori error estimates for parabolic partial differential equations with small randomness in a Robin boundary condition.** (joint with G.M.M. Reddy, A.K. Pani and S. Larrson). Submitted. <https://arxiv.org/abs/2606.25640>
2. ***A posteriori* error estimates for the BDF2 method for parabolic partial differential equation with small random input data.** (joint with G.M.M. Reddy and M. Vynnycky). Under Preparation.

Published Articles

1. ***A posteriori* error estimates for the Crank-Nicolson method: application to parabolic partial differential equation with small random input data.** (joint with G.M.M. Reddy and

M. Vynnycky). J. Sci. Comput., 104(2025). Springer. <https://link.springer.com/10.1007/s10915-025-02912-2>.

2. **Anisotropic *a posteriori* error analysis for the two-step backward differentiation formula for parabolic integro-differential equation.** (joint with G.M.M. Reddy and A.K. Pani). J. Sci. Comput., pp. 1-26, 93(2022). Springer. <https://link.springer.com/article/10.1007/s10915-022-01996-4>.

AWARDS & RECOGNITIONS

1. Awarded funding of INR 1,72,000 from ITS (International Travel Scheme) by SERB, India to attend and contribute a talk at the ADMOS-2023 conference held in Gothenburg, Sweden (2023)
2. Qualified the National Level Test Joint Admission test for M.Sc. (JAM 2015)
3. Qualified the Telangana State Eligibility Test (TS-SET 2018)

CONTRIBUTED TALKS

1. *A posteriori error estimation for the two-step backward difference formula: application to parabolic PDEs subject to Robin boundary condition with small randomness at **LACAM 2025**.* IISER Tiruvananthapuram, Kerala, India, November 2025.
2. *A posteriori error estimation for the parabolic partial differential equation with small randomness in the Robin boundary condition at **NCRDMS 2025**.* Hyderabad Central University, Hyderabad, India, March 2025.
3. *Elliptic reconstruction and a posteriori error estimates for parabolic partial differential equations with small random input data, 89th annual conference of **Indian Mathematical Society**.* BITS Pilani, Hyderabad, India, Dec 2023.
4. *A posteriori error estimates for the Crank-Nicolson method: application to parabolic partial differential equation with small random input data at **ADMOS 2023**.* Chalmers University of Technology, Gothenburg, Sweden, June, 2023.

WORKSHOPS

1. Quantum Algorithms for Differential Equations, The Fields Institute, University of Toronto, Canada, July, 2026
2. Robust Adaptivity for Nonlinear Partial Differential Equations, Inria Paris, March, 2026
3. Differential Equations and Physics-Informed Neural Networks with Applications in Engineering, IIT Mandi, India, February, 2026.
4. Machine Learning, Work Integrated Learning Programmes (WILP) division, BITS Pilani, Hyderabad Campus, India, July, 2025.
5. NCMW - Finite Element Methods for PDEs, IISER Thiruvananthapuram, India, September, 2023.
6. Finite Element Method, Theory and Computation, IIT-Delhi, India, July, 2023.

TEACHING AND MENTORSHIP

WILP BITS Pilani Hyderabad Campus

Lead Instructor

1. Bridge Course - Calculus for Speech and Hearing Impaired Participants, working in TATA Motors (May-July 2026)
2. BCIEZC111 - Linear Algebra and Calculus (Semester II 2025-2026)
3. AEZG535/DEZG535 - Advanced Engineering Mathematics (Semester II 2025-2026)
4. PSDRLZC113 - General Mathematics (Semester I 2025-2026)
5. AEZG535 - Advanced Engineering Mathematics (Semester I 2025-2026)
6. MATHZC233 - Calculus (Semester I 2025-2026)
7. DEZG535 - Advanced Engineering Mathematics (Semester I 2025-2026)
8. MTGEZC233 - Calculus (Semester II 2024-2025)

Learning Facilitator (Teaching Assistant)

1. AIML ZC416 - Mathematical Foundations for Machine Learning (Semester I 2026-27, Semester II 2023-24 and Semester I 2024-25)

Faculty Mentor

1. Served as Faculty Mentor for seven dissertation projects (B.Tech and M.Tech), providing guidance on literature review, methodology, and dissertation preparation.

BITS Pilani Hyderabad Campus

Teaching assistant for bachelor and master level courses

1. MATH F211 - Mathematics III [Linear Algebra and Linear Programming Problems] (Semester I 2023-24)
2. MATH F343 - Partial Differential Equations (Semester II 2022-23)
3. MATH F313 - Numerical Analysis (Semester I 2022-23)
4. MATH F341 - Functional Analysis (Semester II 2021-22)
5. MATH F111 - Mathematics I [Advanced Calculus] (Semester I 2021-22)
6. MATH F112 - Mathematics II [Linear Algebra & Complex Analysis] (Semester II 2020-21)

COMPUTATIONAL SKILLS

1. FreeFEM++ (C++ Environment)

REFERENCES

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| <ol style="list-style-type: none"> 1. Prof. Gujji Murali Mohan Reddy
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