MAMTA SAINI

Indian Institute of Science, Bangalore, India

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RESEARCH INTEREST

My research interests focus on Scientific Machine Learning, particularly in developing Physics-Informed Neural Networks (PINNs) and Neural Operators with applications in fluid dynamics, electromagnetics, and computational physics.

EDUCATION

National Institute of Technology Kurukshetra, Haryana *August 2023 - May 2025*
Master of Science in Mathematics CGPA: 8.87/10
Thesis: **Study of Fractional Physics Informed Neural Networks for Time Fractional Equations** (with Prof. A.S.V. Ravi Kanth)

ARSD, University of Delhi, New Delhi *August 2020 - May 2023*
Bachelor of Science in Mathematics (Honours) CGPA: 8.5/10

RESEARCH EXPERIENCE

Indian Institute of Science, Bangalore *May 2025 – Present*
Scientific Machine Learning Engineer, Zenteiq.ai
Advisors: Prof. Sashikumaar Ganesan

- Developing Physics-Informed Neural Networks (PINNs) and Geometry-Informed Neural Operators (GINOs) for accurate prediction of magnetic fields in stator geometries.

National Institute of Technology, Kurukshetra *May 2024 – July 2024*
Research Scholar
Advisors: Prof. A.S.V. Ravi Kanth

- Conducted research on Physics-Informed Neural Networks (PINNs) for solving time-fractional and nonlinear PDEs. Implemented PINNs in TensorFlow for Burgers–Huxley and Convection–Diffusion equations.

National Institute of Technology, Kurukshetra *Aug 2023 – May 2024*
Research Intern
Advisors: Dr. Harshita Madduri

- Conducted comparative study of numerical solvers for ODEs and PDEs. Analyzed accuracy, convergence, and computational efficiency. Presented results through numerical experiments on classical PDEs.

RELEVANT COURSEWORK

Fluid Mechanics: Advanced Fluid Dynamics, Dynamics system and Control
Mathematics: Linear Algebra, Sequence and Series, Univariate Calculus, Ordinary Differential Equations & Multivariate Calculus, Vector Calculus & Partial Differential Equations, Probability & Statistics, Discrete Mathematics
Computational Science & Programming: Computational Fluid Dynamics, Numerical Methods & Computer Programming (Python), Introduction to Machine Learning (NPTEL), Data Analytics with Python

TECHNICAL SKILLS

- **Languages:** Python
- **Scientific Computing** - Gmsh, ParaView, CUDA
- **Data Science** - TensorFlow, Scikit-learn, NumPy, Pandas, Matplotlib, SciPy, SymPy
- **Research Tools** - Git, LaTeX, VSCode, Vim, Jupyter, Markdown, GitHub Actions, ClearML

PROFESSIONAL DEVELOPMENT

- **International Conference on Applied AI and Scientific Machine Learning (CASML) 2024**, Indian Institute of Science Bangalore *18-22 December, 2024*

LEADERSHIP & ACHIEVEMENTS

- **Founder & President**, Anant: The Mathematical Society, NIT Kurukshetra (2023-2025)
- **Placement Coordinator**, NIT Kurukshetra (2024-2025)
- **Ex-Core Head**, National Service Scheme, Delhi University
- **Winner**, Tug of War Sports meet, 2023