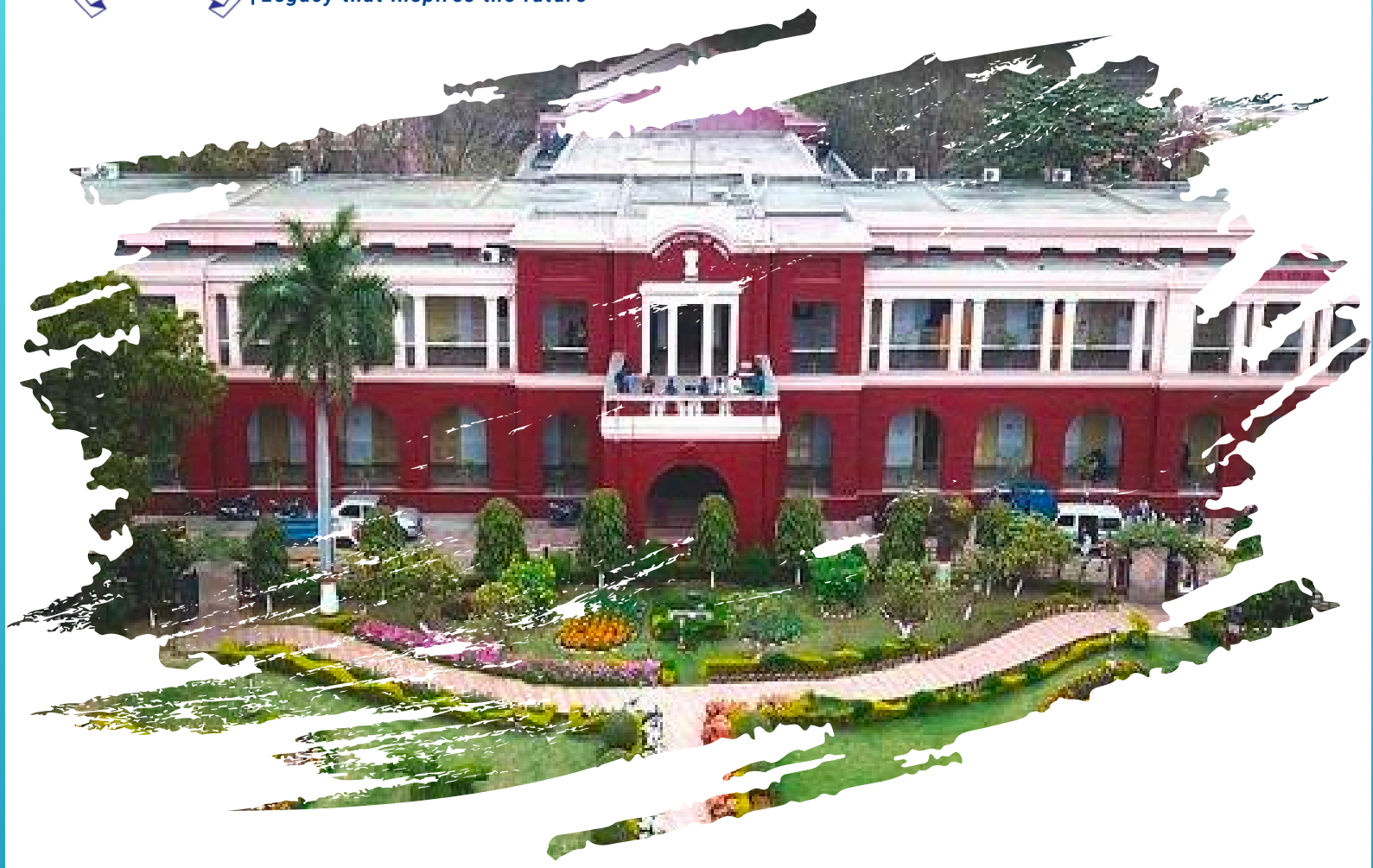
INDIAN INSTITUTE
OF TECHNOLOGY
(INDIAN SCHOOL OF MINES)
DHANBAD

Legacy that inspires the future

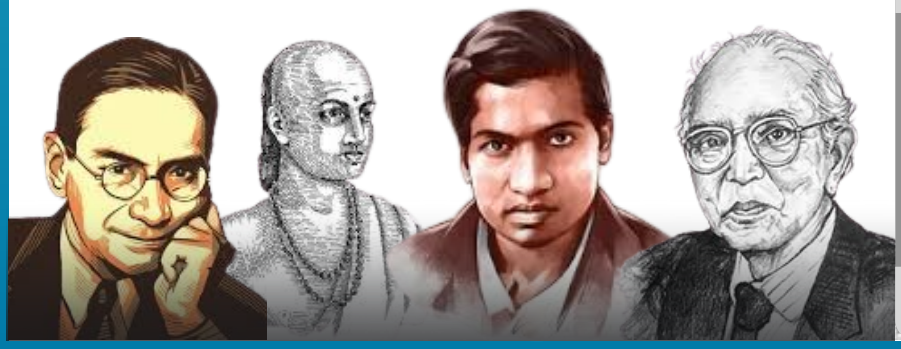
APRIL 2025
VOL. 2 | ISSUE 4

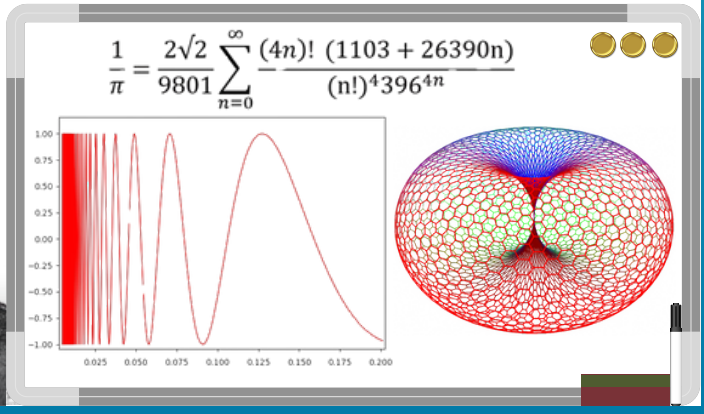


GANANAM

A Monthly Newsletter of

Department of Mathematics and Computing





EVENTS ORGANIZED

National Conference on Data Predictive Analytics & Numerical Simulations during April 23-25, 2025, organized by **Prof. P. S. Rao** and **Prof. Shuvashree Mondal** (convenors) and **Prof. Kartikay Gupta** (Organizing Secretary).

Data predictive analytics and numerical simulations are two cutting-edge methodologies that play a pivotal role in modern decision -making and problem - solving across various industries. The National Conference on Data Predictive analytics and Numerical Simulations aims to bring together leading academic scientists, researchers, and research scholars to exchange and share their experience and ideas in the field . Also, it aims to serve as a platform for exploring new trends in data predictive analysis and foster collaborations and networking among the researchers working in the area.

The conference hosted sessions on data-driven computation; AI/ML applications in real-life systems; numerical computation; IoT in real data-driven systems; weather forecasting for scientific applications; predictive analytics; cutting-edge techniques in numerical simulations; neural networks, deep learning, reinforcement learning; data governance, privacy, and security; adaptive simulations using AI, and case studies in healthcare, finance, marketing, and manufacturing.

PUBLICATIONS

- P. Kumari, A. Bhattacharjee, **G. K. Vishwakarma**, and F. Tank, afthd**:** Bayesian accelerated failure time model for high-dimensional time-to-event data, Japanese Journal of Statistics and Data Science, 1-31, 2025.
- A.P. Singh, **S.P. Tiwari** and I. Perfilieva, L-fuzzy transforms: An operator oriented approach, Soft Computing, 1-13, 2025.
- **J. Dasgupta,** Chandranandan Gangopadhyay, Kiumars Kaveh, Christopher Manon, Equivariant vector bundles on complexity-one T-varieties and Bruhat-Tits buildings, International Mathematics Research Notices.
- P. Kumari and **A. Antony Selvan,** Sampling with derivatives in finitely generated shift-invariant spaces, Journal of Computational and Applied Mathematics, 470, 2025.
- T. C. John, **Hemant K. Mishra**, and S. Guha, A complete classification of passive unitary normalizable (PUN) Gaussian states, to appear in the conference proceeding of IEEE ISIT, 2025.
- K. Ji, **H. K. Mishra,** M. Mosonyi, and M. M. Wilde, Converse bounds for quantum hypothesis exclusion: A divergence-radius approach, to appear in the conference proceedings of IEEE ISIT 2025.
- S. Ravikanti, J. Dave, H. Dong, I. Gondal, N. Choudhury, **T. Ojha**, T. P. Raptis, Avatar-Centric Gait Authentication Framework for Secure Metaverse, in 15th Workshop on Management of Cloud and Smart City Systems (with IEEE ISCC 2025), Bologna, Italy, 2025.

INVITED TALKS

- **Prof. S. A. Sahu** delivered an invited talk on "Research Aspects in Continuum Mechanics" in ACM-2025 at Department of Mathematics, Gati Shakti Vishwavidyalaya, Vadodara Gujarat on April 22, 2025.
- **Prof. G. K. Vishwakarma** delivered an invited talk on "Modelling and analysis of time course gene expression data" in National Conference on Statistical Methods and Applications in Interdisciplinary Areas (SMAIA – 2025), Department of Statistics, Delhi University during April 11-12, 2025.
- **Prof. T. Ojha** delivered two expert talks on “Wirelessly Powered IoT Networks” and “Resource Management in 6G IoT networks” as part of short-term course “Artificial Intelligence & Internet of Things: From Theory to Practice” by MMTCC, IIT Patna on April 24, 2025.
- **Prof. T. Ojha** delivered two invited lectures on “Rise of the Edge Devices: Distributed Computing and Communication for 6G Networks” and “Are we really Empowered? Wireless-powered IoT for Futuristic Networks” as resource person for “Integrating AI and Emerging Technologies in Next-Generation Network Systems” organized by E&ICT academy, IIITDM Jabalpur and SRM University-AP on April 25, 2025 and April 28, 2025.

PHD AWARDED

Dr. Meenakshi Gautam has been awarded a Ph.D. in "Inference on the parameters of skewed univariate and bivariate distributions concentrating on zero-inflated data" under the guidance of **Prof. N. Jana.** Meenakshi's PhD thesis focuses on inference and testing procedures for univariate and bivariate distributions, particularly under zero-inflation. It explores interval estimation and hypothesis testing for parameters of zero-adjusted inverse Gaussian (ZAIG), zero-inflated Rayleigh (ZIR) and lognormal distributions, using classical and Bayesian approaches.

The thesis also proposes new methodologies for comparing means and constructing confidence intervals using tools like MOVER, generalized variables, and higher-order posteriors. A novel bivariate ZIR model is introduced to study dependence in positively skewed, zero-inflated data. Applications span across environmental, agricultural, financial, and biomedical fields, supported by simulation studies and real data illustrations.

MATHEMATICS AND COMPUTING NEWS

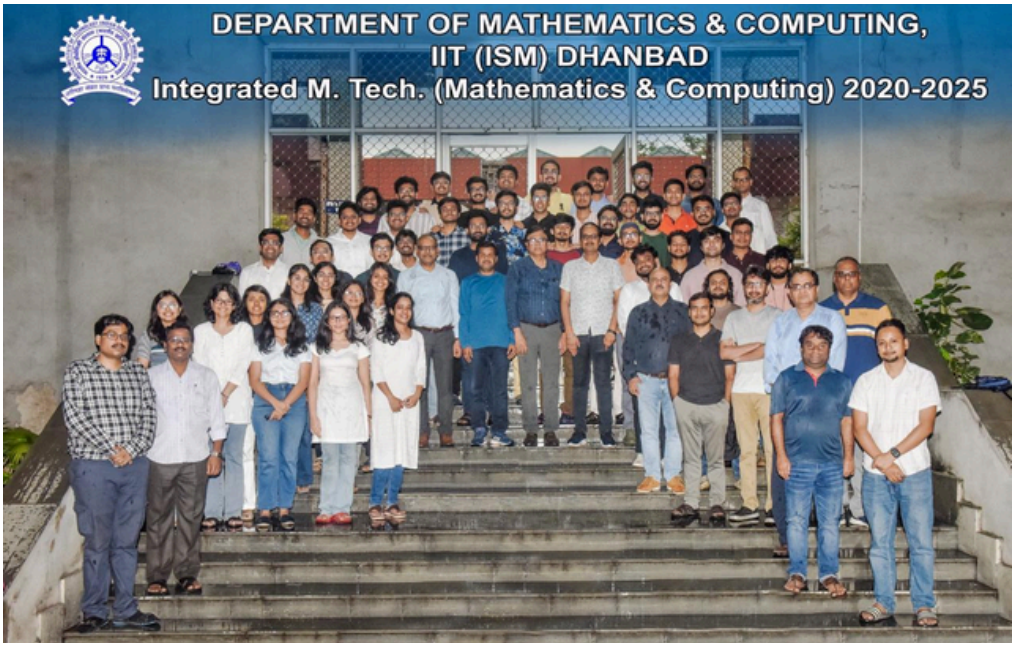
- **Breaking data silos in drug discovery with federated learning:** Federated learning enables collaboration without compromising data privacy, but challenges remain. Now, a data-centric approach named FLuID enhances knowledge sharing in drug discovery, demonstrating improved predictive performance while preserving confidentiality across pharmaceutical companies. [Read More]
- **Mathematician solves algebra's oldest problem using intriguing new number sequences:** UNSW mathematician Norman Wildberger and computer scientist Dean Rubine have introduced a novel method for solving higher-degree polynomial equations, traditionally deemed unsolvable by radicals. Their approach employs a new class of number sequences, termed "hyper-Catalan numbers," forming a structure called the "Geode," which enables solutions without relying on irrational numbers . This development, published in The American Mathematical Monthly, represents a significant shift in algebraic theory. [Read More]

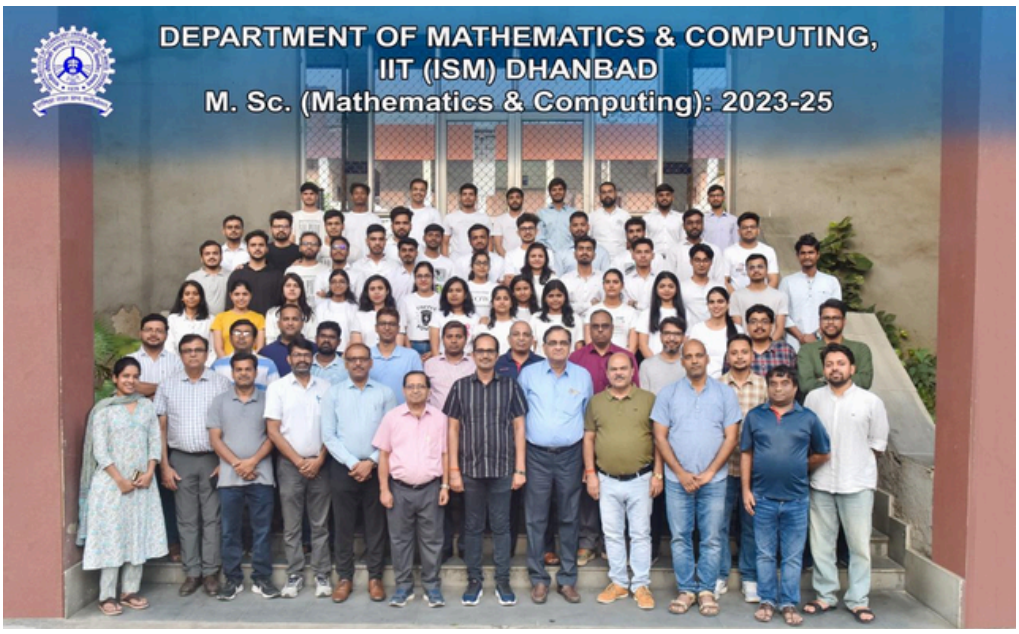
OTHER RESPONSIBILITY

- **Prof. G. K. Vishwakarma** joined as a Co-editor for the Brazilian Journal of Biometrics.
- **Prof. T. Ojha** joined as TPC member for LCN 2025 (Sydney, Australia), IEEE SmartGridComm 2025 (Toronto, Canada).

FAREWELL 2025

We bid farewell to the Integrated M. Tech batch of 2020-25 and M. Sc. batch of 2023-25. We are proud of your achievements and confident that you'll make your mark in the world. Wishing you all success and fulfillment ahead.





EDITORIAL TEAM

Prof. S P Tiwari (HOD), Prof. Atul Kumar Verma, Prof. Tamoghna Ojha, Tarun Kr Das.
Contact : gananam@iitism.ac.in