



**INDIAN INSTITUTE
OF TECHNOLOGY**
(INDIAN SCHOOL OF MINES)
DHANBAD

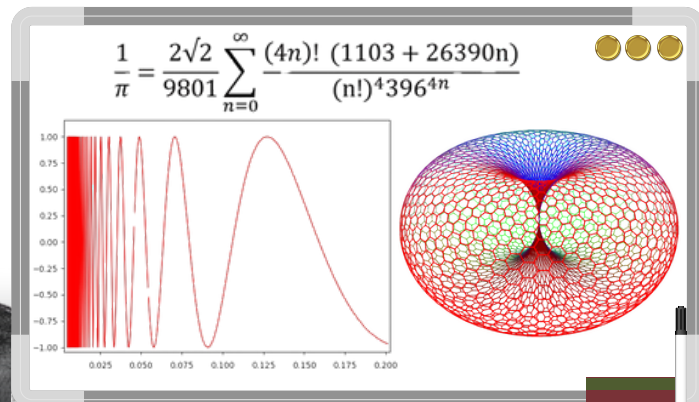
Legacy that inspires the future

MAY 2025
VOL. 2 | ISSUE 5



GANANAM

*A Monthly Newsletter of
Department of Mathematics and Computing*



WELCOME



Prof. Snehajit Misra joined the Department of Mathematics and Computing, IIT (ISM) Dhanbad in May, 2025. Prior to this, he was an Assistant Professor at the Department of Mathematics, SRM University AP, India for three months. He has completed PhD in Mathematics from the Institute of Mathematical Sciences, Chennai which is one of the constituent institutions under Homi Bhabha National Institute, India. After finishing doctoral studies, he has done postdoctoral research at TIFR Mumbai, IIT Bombay, Chennai Mathematical Institute (CMI), Harish Chandra Research

Institute (HRI) and IIIT Delhi. Apart from institute fellowships, his postdoctoral research was supported by SERB - National Postdoctoral Fellowship, NBHM postdoctoral fellowship and fellowship from Infosys Science Foundation. His mathematical research interest lies broadly in Algebraic Geometry and Complex Geometry. He is particularly interested in Positivity problems in Algebraic Geometry, Moduli problems of vector bundles on projective varieties, Connections on holomorphic vector bundles, Seshadri constants etc. During his PhD, he has given a complete description of nef and pseudo-effective cones of projective bundles over higher dimensional varieties, and explicitly computed the Seshadri constants of ample line bundles on these projective bundles. Prof. Misra have also studied the (semi) stability problem of Higgs bundles on ruled surfaces under its ruling in his thesis.

PUBLICATIONS

- Riya Ghosh and **A. Antony Selvan**, Obstructions for Gabor frames of the second order B-spline, Advances in Computational Mathematics, accepted, 2025. SCI
- Ashutosh Kumar, **Manisha Verma** (2025). QD-RetNet : Efficient Retinal Disease Classification via Quantized Knowledge Distillation. Medical Image Understanding and Analysis Conference (MIUA), 15 July- 17July, 2025, Leeds, UK. (accepted)

PATENT

Patent granted: Design number: 6435302 Grant date: 10 April 2025 Registration date: 05 April 2025 Patent Name: Medical Device for Detection of Mouth Cancer Granted Names: **Prof. P S RAO** & Others.

INVITED TALKS

- **Prof. P. S. Rao** delivered a talk on “Numerical Study of Convective Heat Transfer using AI/ML Approach”, at Department of Engineering Science, IIIT Gwalior, Workshop on CFD Applications: AI/ML during May 1-6, 2025.
- **Prof. H. K. Mishra** delivered a lecture on Simultaneous symplectic reduction of quadratic forms into normal forms, CUSAT, Department of Mathematics, May 8, 2025.
- Prof. G. K. Vishwakarma delivered an invited talk on "Statistics in Machine Learning for Data Analytics" in national conference AMLDA 2025 organized by Department of Computer Science, Maharaja Sriram Chandra Bhanja Deo University Takatpur, Baripada, Odisha, 07-08 May 2025.
- **Prof. H. K. Mishra** delivered a lecture on a complete characterization of passive unitary normalizable (PUN) Gaussian states, CUSAT, Department of Mathematics, May 9, 2025.
- **Prof. T. Ojha** delivered an invited talk on “Resource Management in Future IoT Networks” at IEEE Computer Society Student Branch Champer, IIT Kharagpur on 23 May 2025.
- **Prof. T. Ojha** delivered invited talks on “Energy aspects of Future IoT Networks” and “Communication and Computation in Future IoT Networks” at Faculty Development Program on “IoT: Recent Advances, Challenges, and Opportunities” organized by EICT Academy, IIT Roorkee at Brainware University, Kolkata on 26 and 27 May 2025.
- **Prof. A. Kalita** delivered a talk on “How to Set Up Resource-Constrained IoT Networks and Conduct Experiments” at FDP on “IoT: Recent Advances, Challenges, and Opportunities (IoT: RACO)” organized by EICT Academy IIT Roorkee and Brainware University, Kolkata, India, on 25-28 December, 2025.

EVENTS



Prof. Aryan Kaushik, Associate Professor, Manchester Met, UK presented the *3rd Lecture* of **Centenary Talk Series** organized by the Department of Mathematics and Computing. Prof. Kaushik discussed the evolution toward IMT-2030/6G, covering key trends, challenges, standardization efforts, spectrum opportunities, and emerging use cases. He focused on the role of Integrated Sensing and Communications (ISAC) in enabling integrated 6G services, highlighting its synergy with ubiquitous intelligence, non-terrestrial networks, and applications in public safety and robotics. The talk was held in online mode.

SPONSORED PROJECTS

Prof. Tamoghna Ojha received FRS grant of INR 19.99 Lakhs from IIT (ISM) Dhanbad for the project "Energy-Efficient Federated Deep Reinforcement Learning for Multi-UAV Edge Intelligence Using Tiny Models", May 2025 – May 2027.

PHD STUDENTS' ACTIVITY

- Research Paper entitled "Modelling of Irregular Longitudinal Data Using Binning and Interpolation" presented by **T. Majumdar** in national conference on "Advances in Machine Learning for Data Analytics" organized by the Department of Computer Science, Maharaja Sriram Chandra Bhanja Deo University Takatpur, Baripada, Odisha during 07-08 May 2025.
- Research Paper entitled "Enhancing Survival Risk Prediction through Imputation and Feature Selection in High-Dimensional Longitudinal Time-to-Event Protein Biomarker Data" presented by **N. Kumar** in national conference on "Advances in Machine Learning for Data Analytics" organized by the Department of Computer Science, Maharaja Sriram Chandra Bhanja Deo University Takatpur, Baripada, Odisha during 07-08 May 2025.

MATHEMATICS AND COMPUTING NEWS

- **Large language models (LLMs):** The advanced AI behind tools like ChatGPT are increasingly integrated into daily life, assisting with tasks such as writing emails, answering questions, and even supporting healthcare decisions. But can these models collaborate with others in the same way humans do? Can they understand social situations, make compromises, or establish trust? A new study reveals that while today's AI is smart, it still has much to learn about social intelligence. [[Read More](#)]
- **How math helps to protect crops from invasive disease:** New research demonstrates how mathematical modeling can predict outbreaks of toxic fungi in Texas corn crops -- offering a potential lifeline to farmers facing billions in harvest losses. [[Read More](#)]

PHD AWARDED



The completion of Doctor of Philosophy (Ph.D.) degree of **Mr. Mahesh Kumar Pandey** (21DR0089) was notified by IIT (ISM) Dhanbad vide notification No. Exam/219905/Ex.Bd./2007-08(Vol.III) dated 09 th June, 2025 on his research topic "Some Improved Alternative Estimation Procedures of Population Parameters in Sample Surveys". The Ph.D. research works of Mr. Pandey completed under the supervision of **Prof. G. N. Singh** contributes significantly to the estimation problems of finite population parameters under different challenges being faced in

survey sampling research. His works focus on mitigating the adverse effects of non-sampling errors, including random non-response, measurement errors, outliers, and missing data problem often occur in practice of survey research. Mr. Pandey proposed improved estimators of population mean, variance, and coefficient of variation under complex sampling designs such as Ranked Set Sampling (RSS), Median RSS (MRSS), Two-Phase Stratified Random Sampling, and Successive Sampling. His works incorporate robust regression, calibrated weighting, and advanced imputation methods to enhance the efficiency with reduced bias of the suggested estimation procedures. Theoretical properties are well supported through simulation and empirical studies which justify the study and make it eligible for its potential applications in real-life problems. The outcomes of his Ph.D. research have been published in reputed Web of Science-indexed journals.

EDITORIAL TEAM

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