

# GANANAM

*A Monthly Newsletter*



**IIT**  
**ISM** INDIAN INSTITUTE  
OF TECHNOLOGY  
INDIAN SCHOOL OF MINES  
DHANBAD



## From the HOD's Desk

*“Mathematics is the poetry of logical reasoning when combined together with Computing, the operating system of innovation which powers you with the finest tools available to solve problems of the current and future generations.”*

Dear All,

With great joy, I welcome you to the first edition of “**Gananam**”, the official newsletter of the Department of Mathematics & Computing. This newsletter marks the beginning of an exciting journey, where we aim to keep you updated with the latest events, accomplishments, and activities within our department. Through “**Gananam**”, we hope to create a platform that not only informs but also connects our vibrant community, celebrating our collective pursuit of excellence in Mathematics and Computing.

**Gananam** - This powerful word carries deep meaning: in Tamil, it represents wisdom—a key driver of our quest for knowledge. In Sanskrit, “**gana**” relates to counting, a fundamental principle of mathematics and computation, while “**gan**” connects to “**sanganak**” meaning computer, bridging intellect and technology. Together, these elements embody our mission to inspire and innovate in mathematics and computing. “**Gananam**” is more than a name; it’s a call to action for excellence and exploration in our department.

Our department stands at the forefront of technology, blending the rigor of mathematics with the dynamic field of computer science. We explore algorithms, dive into data analysis, and tackle challenges that shape our digital future. With dedicated faculty and passionate students, we foster collaboration and innovation, equipping ourselves to address real-world challenges and make meaningful contributions.

Join us on this exciting journey as we create “**Gananam**”, our departmental newsletter. Share your stories, research highlights, or article ideas—your unique insights make our community dynamic. Let's showcase our talent, celebrate achievements, and connect students, faculty, and alumni. Together, we can make it a true reflection of our department's spirit. We look forward to your contributions!



Finally, I would like to extend my heartfelt gratitude to everyone who played a role in bringing this first edition of “**Gananam**” to life. Your dedication, creativity, and hard work have made this possible, and I am truly grateful for your contributions. Thank you for being a vital part of our journey. Here's to a bright future ahead, filled with knowledge, innovation, and collaboration!

Warm regards,

Prof. R.K. Upadhyay

## Spotlight



**Dr. Alakesh Kalita** has joined the department as an Assistant Professor in August 2024. Before this, he was a Lecturer at Singapore University of Technology and Design (SUTD). He also worked in the Department of Electrical and Computer Engineering at the National University of Singapore, Singapore as a Postdoctoral Research Fellow. He obtained his BTech and MTech degree in the department of Computer Science and Engineering from Assam Don Bosco University and Assam Central University, respectively, followed by Ph.D. from the Department of Computer Science and Engineering at the Indian Institute of Technology Guwahati, India. He received the Innovative Student Projects Award 2022 (equivalent to Best Thesis) from the Indian National Academy of Engineering (INAE) for my Ph.D. thesis. He is a Senior Member of IEEE and his research interests include Internet of Things, and Computer Networks.

**Dr. Tamoghna Ojha** has joined the department as an Assistant Professor in September 2024. Previously, he was an Assistant Professor of Computer Science at the BITS Pilani Hyderabad campus, and SRM University-AP, India. He has received MS and PhD in Computer Science from the IIT Kharagpur. During 2021-2023, he was an ERCIM “Alain Bensoussan” Post-Doctoral Research Fellow at the Institute for Informatics and Telematics (IIT) of National Research Council (CNR), Italy. He has also worked with the Department of Information Engineering, University of Pisa, Italy as a Research Consultant for 3 months. He has received research grants of more than INR 50,00,000 from Govt. of India and Intel Inc. His current research interests are in Edge Computing and IoT, Wirelessly Powered IoT, and 6G Networks. He is a Senior Member of IEEE (SM’23) and was 2016 IEEE Richard E Merwin Student scholar. He has won the GE Edison Challenge 2013 with INR 10,00,000. He regularly serves as a TPC member and in the organizing committee of various reputed international conferences.



## Sponsored Projects

- “Study of non-linear advection-dispersion equation and their Applications” ANRF, Prof. **Mritunjay Kumar Singh**, Rs 383458, Sept.,2024
- Enhanced modeling of non-metallic inclusions via multivariate population balance approaches, FRS (IIT-ISM), **Dr. Ashok Das**, INR 11,00,000.00 , Aug 2024.
- Investigating Intracellular Dynamics Neuronal Transport Using Mathematical Modeling, FRS IIT (ISM) Dhanbad, **Dr. Atul Kumar Verma**, INR 17,58,889, July 2024.
- Advancing Retinal Disease Predication Utilizing Deep Learning, FRS IIT (ISM) Dhanbad, **Dr. Manisha Verma**, INR 19,44,000, July 2024.
- Isometric dilation of contractions on Musielak-Orlicz Spaces, FRS IIT (ISM) Dhanbad, **Dr. Neeru Bala**, INR 7,26,0000, July 2024.
- Classification of equivariant principal bundles on T-Varieties, FRS IIT (ISM) Dhanbad, **Dr. Jyoti Dasgupta**, INR 12,00,000, July 2024.

## Invited Talks

- **Prof. R. K. Upadhyay** delivered a Keynote Talk in the conference RAAM 2024 during July 03-05, 2024 at Department of Mathematical Sciences, IIT (BHU) Varanasi, Uttar Pradesh, India.
- Invited talk on Fuzzy automata based on residuated lattices: A mathematical perspective, IIT (BHU) Varanasi, Department of Mathematical Sciences, July 03-05, 2024 by **Prof. S P Tiwari**.
- Invited Talk on "AI/ML Applications in CFD", International Conference on Nonlinear Analysis and Scientific Computing, Sept 26-28, 2025, Vignana University, Guntur by **Prof. P S Rao**.
- Delivered invited talk on Quantum Codes in IITB-Virginia Tech, USA joint workshop at IIT Bombay, India, Dates: August 25-27, 2024 by **Prof. Abhay Kumar Singh**.

# Publications

- **Upadhyay, R.K.** and Barman, D., 2024. Deciphering two delay dynamics of ecological system with generalist predator incorporating competitive interference. *Physica D: Nonlinear Phenomena*, 468, p.134293.
- Jia, J., Hu, D., **Upadhyay, R.K.**, Zheng, Z., Zhu, N. and Liu, M., 2024. Canard cycle, relaxation oscillation and cross-diffusion induced pattern formation in a slow-fast ecological system with weak Allee effect. *Communications in Nonlinear Science and Numerical Simulation*, p.108360.
- Mandal, S., Samanta, S., Tiwari, P.K. and **Upadhyay, R.K.**, 2024. Bifurcation analysis and exploration of noise-induced transitions of a food chain model with Allee effect. *Mathematics and Computers in Simulation*.
- Lenka, B. K. and **Upadhyay, R. K.**, 2024. New Lyapunov stability theorems for fractional order systems. *Journal of Nonlinear, Complex and Data Science*
- **Chatterjee, S.** and Saha, D., 2024. Software dependability analysis under neutrosophic environment using optimized Elman recurrent neural network-based classification algorithm and Mahalanobis distance-based ranking algorithm. *Annals of Operations Research*, pp.1-33.
- Tripathi, A., **Tiwari, S.P.**, Jacob, K. and Mahato, S., 2024. F-transforms determined by overlap and grouping maps over a complete lattice. *Soft Computing*, pp.1-20.
- Kumari, M., Yadav, V.K., Ruhela, S. and **Tiwari, S.P.**, 2024. On categories associated with crisp deterministic automata with fuzzy rough outputs and fuzzy rough languages. *Soft Computing*, pp.1-20.
- Pandey, M.K., **Singh, G.N.** and Zaman, T., 2024. Estimation of Population Mean Using Some Improved Imputation Methods for Missing Data in Sample Surveys. *Communications in Statistics-Theory and Methods*, pp.1-15.
- Pandey, M.K., **Singh, G.N.** and Bandyopadhyay, A., 2024. Efficiency study of a robust regression-type estimator for population mean under different ranked set sampling methods with outlier handling. *Brazilian Journal of Probability and Statistics*, 38(2), pp.232-252.
- **Singh, G.N.**, Bhattacharyya, D. and Bandyopadhyay, A., 2024. Non-randomized scrambling models for sensitive quantitative attribute using innocuous characteristics. *Journal of Statistical Computation and Simulation*, pp.1-17.
- **Singh, G.N.**, Bhattacharyya, D. and Bandyopadhyay, A., 2024. Some estimation procedures for Covid-19 suspected persons in a locality using randomized response model. *Brazilian Journal of Probability and Statistics*, 38(1), pp.74-87.
- Pandey, M.K., **Singh, G.N.**, Zaman, T., Mutairi, A.A. and Mustafa, M.S., 2024. A general class of improved population variance estimators under non-sampling errors using calibrated weights in stratified sampling. *Scientific Reports*, 14(1), p.2948.
- **Singh, G.N.**, Bhattacharyya, D. and Bandyopadhyay, A., 2024. A new randomized response technique with application to election polling. *Communications in Statistics-Simulation and Computation*, 53(1), pp.94-116.

# Committee Member

## Prof. R. K. Upadhyay

attended CRG review committee meeting of ANRF as a Committee member in Doon University Dehradun during 26-27 September 2024.

**Prof. M K Singh** joined as Member, Selection Committee of Faculty at NIT Jamshedpur.

# NPTEL Course

**Prof. S P Tiwari** is offering an NPTEL course on Essential of Topology

# Upcoming Conference

**Prof. P S Rao** received fund to conduct a National Conference on Data Predictive Analytics and Numerical Simulation has been received from Anusandhan reserach Foundation, New Delhi for an amount of Rs: 4.0 Lakhs.

**Dr. Tamoghna Ojha** will organize a workshop on "Distributed Computing in 6G IoT" at IEEE ANTS 2024, to be held at IIT Guwahati from 15-18 December 2024.

# Publications

- **Rao, P.S.** and Barman, P., 2024. Natural Convection in an Open and Wavy Porous Cavity Submitted to a Partial Heat Source. International Journal of Applied and Computational Mathematics, 10(5), p.153.
- Rahul, A.K., Singh, M.K., Tiwari, R., Paul, S., **Rao, P.S.** and Biswas, R., 2023. Semi-analytical approach-based studies of the squeeze film lubrication between rough porous annular discs: Rabinowitsch fluid model.
- Biswas, M. and **Sahu, S.A.**, 2024. Longitudinal plane wave amplitude in N-type semiconductors with inviscid liquid loading and impedance boundary. Mechanics of Advanced Materials and Structures, pp.1-16.
- Kirti and **Sahu, S.A.**, 2024. On plane wave scattering at the piezothermoelastic half-space with impedance boundary condition. Acta Mechanica, pp.1-16.
- Shukla, S. and **Sahu, S.A.**, 2024. Shear wave velocity in a functionally graded piezoelectric semiconductor plate clamped on a rigid base. Smart Materials and Structures, 33(10), p.105006.
- Bhoi, S.S., Parampalli, U. and **Singh, A.K.**, 2024. Construction of DNA codes with multiple constrained properties. Cryptography and Communications, pp.1-15.
- Yadav, N., Ansari, Z., Singh, R., Das, A., Singh, S., Heinrich, S. and Singh, M., 2024. Explicit and approximate solutions for a classical hyperbolic fragmentation equation using a hybrid projected differential transform method. Physics of Fluids, 36(9).
- Sadab, M. and **Kundu, S.**, 2024. Analysis of Love-Type Waves in Functionally Graded Composite Structure with Interfacial Imperfections. International Journal of Geomechanics, 24(8), p.04024170.
- Kumari, C., **Kundu, S.**, Maity, M. and Znak, V.I., 2024. Comparative study of the piezo-viscous effect of SH wave propagation with irregular and irregular free interfaces in different piezo-electric stratified media. Waves in Random and Complex Media, 34(4), pp.2443-2460.
- **Kundu, S.**, Kumar, D., Rajak, B.P. and Gupta, S., 2024. Impact of imperfectness on the love-type wave propagation in a viscoelastic composite structure with couple stress. Journal of Vibration and Control, 30(13-14), pp.3048-3063.
- Priyanka, K. and **Selvan, A.A.**, 2024. Derivative sampling expansions in shift-invariant spaces with error estimates covering discontinuous signals. IEEE Transactions on Information Theory.

# Achievement

## Prof. R.K. Upadhyay

appointed as an Editor-In-Chief of the Journal of Innovation Sciences and Sustainable Technologies- A Make in India Creation <https://jisst.com/>

# PhD Awarded

**Animesh Samanta** is awarded PhD under **Prof. M K Singh** on topic "*Mathematical Study Of Contaminant Concentration Distribution in Porous Formation*" in Aug, 2024

# New Postdoc

## Dr. Sevak Ram Sahu

joined as **Research Associate-I** in the Project entitled "Design and assessment of complex network models and their applications to halt Brain Disorder (SERB(CRG)/2024-2025/1112/MnC) on 18 September 2024 with Prof. R. K. Upadhyay.

# Editorial Team

**Editor-in-Chief:** Prof. Ranjit Kumar Upadhyay

**Editor:** Prof. P S Rao

**Associate members:** Dr. Atul Kumar Verma, Dr. Tamoghna Ojha

## Contact:

Email: mc@iitism.ac.in

Phone: 0326-223-5283(O)

Fax: 0326-2296563