NIT DELHI
RESEARCH BULLETIN

अनुसंधान

SHOWCASING INSTITUTES'S RESEARCH ACTIVITIES

VOLUME 1, ISSUE 1 & 2, 2022

JANUARY –JUNE 2022

राष्ट्रीय प्रौद्योगिकी संस्थान दिल्ली

National Institute of Technology Delhi

EDITORIAL BOARD

INDEX

Message from the Patron	4
Foreword	5
NIT Delhi – At a Glance	6
Areas of Research at NIT Delhi	7
Memoranda of Understanding and Partnership Agreements	8
Awards and Honors	9
Patent Applications Filed	9
Journal Publications	9
Expert Talks/Seminars/FDP/Conference/Other Events Organized	15
News Coverage of the Institute's Research Activities	21
Recently Awarded Externally Funded Research Projects	23
Recently Awarded Consultancy Projects	25
Books Published	26
Book Chapters Published	26
Expert Talks Delivered and Conference Papers Presented	27

MESSAGE FROM THE PATRON

India is celebrating Azadi ka Amrit Mahotsav to commemorate 75 years of independence and the glorious history of its people, culture, and achievements. On this auspicious occasion, the National Institute of Technology (NIT) Delhi will inaugurate the first issue of our Research Bulletin 'अनुसंधान'. NIT Delhi, an institute of innovative and pioneering research, aspires to be the technological research leader. I am confident that 'अनुसंधान' will provide a setting for our faculty and research scholars to showcase their research and innovation accomplishments.

It is remarkable that NIT Delhi's innovation and research have flourished in spite of the difficulties, limitations, and pandemic-related restrictions. Despite several obstacles, our faculty members and scholars didn't allow the travails of life to pull us down. Instead, they excelled in research and innovation to put us in 194th position in the NIRF Ranking System.

In 2022 when NIT Delhi transitions from its transit campus to permanent campus, it has an ambitious plan to provide world-class infrastructure to its students and scholars, build resources to make it a leader in important technological research and innovation, facilitate entrepreneurship, establish cutting-edge laboratories, and ensure that the students from all backgrounds can thrive at this campus. We aspire to take the lead in the ethical and responsible development of technologies that change society.

It fills me with immense pride to share with you the institute's research achievements through 'अनुसंधान'.

Prof. (Dr.) Ajay Kumar Sharma
Director, NIT Delhi

FOREWORD

The dissemination of research findings is an important component in the research process since it aids in translating the findings for other researchers, professionals, and the wider public. The astonishing pace at which the "knowledge economy" is growing makes it imperative that we share the ongoing research with the global academic community.

It is thus an honour to announce the launch of a Research Bulletin 'अनुसंधान' to showcase ongoing research projects and highlight the most significant research outputs of both faculty and students of NIT Delhi. We firmly believe that after the release of the inaugural issue of 'अनुसंधान', faculty and students will be inspired to collaborate on themes of mutual interest, leading to future research that will be robust. In our joint opinion, young engineers ought to use it as an inspiration to work harder and accomplish more in their research and careers.

We want to take this chance to thank the Hon'ble Director, Prof. Ajay Kumar Sharma, for coming up with such a brilliant and timely initiative. May this bulletin serve as a springboard for quality publications and research articles. We all take pride in the fact that, as a result of the peer-research, consultancy, and research projects, NIT Delhi now ranks among the top 200 technical institutes in India. While we are pleased with our current rank (194 in Engineering category) in the NIRF 2022, maintaining and improving our academic standards will necessitate more comprehensive research and consultancy projects. We firmly believe that 'अनुसंधान' will help us stay on task as we pursue our objectives. We are thankful to all the departments, their heads, and faculty members for sharing the research information and data for the bulletin.

In the upcoming issues of 'अनुसंधान', we look forward to welcome and highlight the pertinent news of our institute's research accomplishments.

Dr. Amit Mahajan
Associate Professor

Editors: अनुसंधान

Dr. Anuj Kumar Sharma
Associate Professor

NIT DELHI – AT A GLANCE

National Institute of Technology Delhi (NITD) is one of the thirty NIT(s) established in the year 2010 by an act of the parliament and has been declared as an Institute of National importance. NIT Delhi is an autonomous Institute, which functions under the aegis of the Ministry of Education, Government of India. It aims to provide education and research facilities in various disciplines of Engineering, Science and Technology, Management, Social Sciences, and Humanities for advanced learning and dissemination of knowledge. The mission of NIT Delhi is to develop a highly intelligent and deeply ethical human resource, a workforce which is creative, competitive and innovative. The Institute is imparting holistic education, along with inculcating high moral values in its students.

NIT Delhi started its academic session in 2010 and it was operating from its transit campus at Narela, Delhi until recently. The institute has now completely shifted to its permanent campus situated on NH-1 (GT Karnal Road), Narela sub-city, New Delhi. The institute offers B. Tech. programmes in three areas of technology (Computer Science and Engineering, Electronics and Communication Engineering, and Electrical Engineering), M. Tech. programmes in five disciplines, along with Ph.D. programmes in all branches of Science and Engineering. The institute is all set to start B. Tech. programmes in two new branches (Mechanical Engineering and Civil Engineering) from academic session 2022-23.

The institute makes all attempts to establish strong research collaborations in evolving fields of research in science and engineering. The programmes like joint thesis work, inter-institute collaborative projects, institute assistantship to PG and doctoral students, and administrative support to faculty members for taking up research and consultancy work (sponsored by external agencies). From 2022-23 academic session, the institute has started the Post-Doctoral Fellowship (PDF) programme to further escalate the research activities.

NIT Delhi is all set to implement the guidelines of National Education Policy (NEP) 2020 for forthcoming batches of students.

AREAS OF RESEARCH AT NIT DELHI

Department/ Stream	Research Areas
Physics	Nanophotonic Sensors and Devices, Plasmonics in thin films and nanostructures, Fiber Optics, Optical Device Modeling, Optical imaging & instrumentation, Biomedical optics, Digital Holography, Microwave imaging and instrumentation, EM Theory in different media, Antennas and wave propagation, MHD waves & Flow
Mathematics	Convection in Fluids, Heat Transfer, Nanofluids, Ferrofluids, Micropolar Fluids, Non-Newtonian Fluids, Porous Media, Computational Applied Mathematics.
Chemistry	Design and synthesis of new porous materials with metal skeleton and their application in catalysis, chemical technology, and host-guest chemistry (molecular adsorption and molecular recognition), electrical, optical and magnetic properties.
Environment Science & Engineering	Environmental Science and Engineering, Environmental Biotechnology, Waste Management, Waste to Energy Conversion
Computer Science and Engineering	Wireless Sensor Networks, Network Theory, Data Analytics, Quantum Computing in Networks, Federated Learning, Machine Learning , Motion analysis, Computer Vision, Cloud Computing, Data Security, 5G, Artificial Intelligence, Data Science, Databases, Big Data Analytics, Data Science, Health Informatics.
Electrical Engineering	Power System Restructuring/Deregulation, Electricity Market, Distributed Generation, Renewable Energy, Security Analysis, Fault Detection, Operation and Control of Power Systems, Smart Energy Network, Electric Vehicle, Power Electronics and applications to Renewable Energy Systems, Smart Grids (Micro/Nano), Modeling, Design and Digital Control of DC Conversion System, Embedded Systems, Modeling & Design of Converters, FPGA Design, Control Systems, Signal Processing, Control Systems, Biomedical Signal processing, Artificial Intelligence, Renewable Energy, Image Processing, Power Systems, Reliability Engineering, Conventional Power Systems Hybrid Power Systems, Power Systems Analysis, and Smart Grid Analysis, RAMS.
Electronics and Communication Engineering	Performance analysis of MOSFET and TFET Devices, Standard cell library characterization, Computer Architecture, VLSI Design, Embedded Systems and Digital Image Processing, RF And Microwave Circuits, Networking, Wireless Communication (4G and 5G), Neural Networks, Signal and Image processing, Computer vision, Robotics, Machine Learning and Pattern Recognition, Artificial Intelligence, Optical Communication and Networks, Wireless Communication, Optoelectronics, Digital VLSI, Game theory, Peer-to-Peer Networks, Blockchain, Peer-to-Peer electricity trading, Semiconductor Devices, Nanophotonics, Speech Processing, Communication and Instrumentation, EM Theory in different media, Antennas and wave propagation etc.
Mechanical Engineering	Additive manufacturing, Non-Conventional machining, Metal matrix composites, Metrology, Manufacturing Science, Advanced Machining Processes, Composite Materials

MEMORANDA OF UNDERSTANDING AND PARTNERSHIP AGREEMENTS

1. NIT Delhi and UNESCO MGIEP

On 9th March 2022, the National Institute of Technology Delhi has signed a partnership agreement with the United Nations Educational, Scientific, and Cultural Organization Mahatma Gandhi Institute of Education for Peace and Sustainable Development (UNESCO-MGIEP). The MoU signed by Prof. Ajay K. Sharma (Director. NIT Delhi) and Prof. Anantha Duraiappah (Director, UNESCO-MGIEP) aimed at providing the faculty and students skills in social and emotional intelligence and resilience, interpersonal skills, and holistic systems-level thinking. The event was attended by Dr. Vivek Shrivastava, Dr. Kapil Kumar, Dr. Harish Kumar, Dr. G. Sheoran, Dr. V. S. Pandey, and dignitaries from UNESCO-MGIEP.

NIT Delhi and UNESCO MGIEP signed an MoU.

2. NIT Delhi and Infosys Ltd.

On 24th May 2022, the National Institute of Technology Delhi has signed an MoU with Infosys Ltd. The MoU is about the sharing of Infosys' Springboard initiative, which aims to accelerate progress on its ESG goal to expand digital re-skilling initiatives to 10 million plus people by 2025. The MoU signed by Prof. Ajay K. Sharma (Director NIT Delhi) and Mr. Thirumala Arohi (Sr. Vice President, Infosys) is aimed at providing a curriculum-rich virtual platform that delivers corporate-grade learning experiences on any device. The event was attended by Dr. Anuj K. Sharma, Dr. Amit Mahajan, Dr. Rishav Singh, and Dr. Manisha Singh, and representatives of Infosys Ltd.


NIT Delhi and Infosys Limited signed an MoU

3. NIT Delhi and RGCIRC

On 6th June 2022, the National Institute of Technology Delhi has signed an MoU with Rajeev Gandhi Cancer Institute and Research Center (RGCIRC). The MoU signed by Prof. Ajay K. Sharma (Director NIT Delhi) and Mr. D. S. Negi (CEO, RGCIRC) is aimed at establishing collaborative research between two organizations through promoting academic and research cooperation and the development of Centre of Excellence in the common areas of research. The event was attended by Dr. Sudhir Rawal (Medical Director, RGCIRC), Dr. V. S. Pandey and Dr. Harish Kumar.

AWARDS AND HONORS

- Ms. Shailza Gotra (Ph.D. supervisor: Dr. V. S. Pandey, Applied Sciences Department) received the 'Mangalagiri' Award for Best Female PhD thesis entitled" Advancements in Design and Development of Dielectric Resonator Antennas" in the Wireless, Antenna and Microwave Symposium (WAMS) – 2022, organized by IEEE.
- Ms. Shailza Gotra and Dr. V. S. Pandey received the best paper award in the 7th Students' Conference on Engineering and Systems (SCES-2022), organized by Department of Electrical Engineering, Motilal Nehru National Institute of Technology Allahabad, Prayagraj, India, July 01-03, 2022. The paper's title was "CubeSat Inter-Satellite Linked-based Log Periodic Antennas for C-band Applications" authored by R. Yadav, V. S. Pandey, S. Kumar, and S. Gotra.
- Dr. Chandra Prakash, CSE Department received the best paper award in the International Conference on Robotics, Control and Computer Vision (ICRCCV-22), organized by the National Institute of Technology Uttarakhand during Feb. 19 – 20, 2022.

PATENT APPLICATIONS FILED

S.N.	Title	Name of Inventors	Application no.	Date of filing
1	Telecentric Digital Holographic Microscopy System and Method for Extended Depth Of Focus Imaging	Vineeta Kumari, Neelam Barak, Gyanendra Sheoran, Ajay Kumar Sharma	202211025485	01 May 2022

JOURNAL PUBLICATIONS

1. Prashant Kumar, Prachi Priya, and Rajni, Mathematical modelling of Visakhapatnam Port utilizing the porous and non-porous breakwaters with finite depth green function, Ocean Dynamics, 2022.
2. Prashant Kumar, Divya Sardana, S. Kaur, P. G. Remya, Rajni, and E. Weller, Influence of climate variability on wind-sea and swell wave height extreme over the Indo-Pacific Ocean, International Journal of Climatology, Year 2022
3. S. Kaur, Prashant Kumar, and Rajni, Nonlinear periodic long waves based on Boussinesq equation for shallow water waves: A coupled FEM modelling, Ocean Engineering, Volume 245, Year 2022
4. Prashant Kumar, S. Kaur S, E. Weller, and I. R. Young, Influence of natural variability climate on extreme wave power over Indo-Pacific Ocean assessed using ERA5, Climate Dynamics, Vol. 58, 2022, Pages 33-1613
5. Vinit Kumar Tripathi, Amit Mahajan, "The destabilizing effect of boundary slip on double diffusive convection in a fluid layer with chemical reaction under variable gravity field", Heat Transfer Research (Begell House), 53(3), 47-66, 2022. DOI: 10.1615/Heat Trans Res. 2021038508 (IF: 2.443)
6. Vinit Kumar Tripathi, Amit Mahajan, "Nonlinear stability analysis of double diffusive convection in a fluid saturated

porous layer with variable gravity and throughflow", Applied Mathematics and Computation, Accepted (Elsevier), 425, 127060, 2022. DOI: https://doi.org/10.1016/j.amc. 2022.127060 (IF: 4.091)

7. P. Kumar, Anuj K. Sharma, and Y. K. Prajapati, "Graphene-based plasmonic sensor at THz frequency with Photonic spin Hall effect assisted by magneto-optic phenomenon", Plasmonics (Springer), Vol. no. 17, 957-963, 2022, DOI: https://doi.org/10.1007/s11468-021-01569-5. (Impact factor: 2.726)
8. S. Singh, Anuj K. Sharma, P. Lohia, D. K. Dwivedi, "Ferric Oxide and Heterostructure BlueP/$MoSe_2$ Nanostructure Based SPR Sensor Using Magnetic Material Nickel for Sensitivity Enhancements", Micro and Nanostructures (Elsevier), Vol. no. 163, 107126, 2022, DOI: https://doi.org/10.1016/j.spmi.2021.107126. (Impact Factor: 2.658)
9. S. Singh, P. Lohia, Anuj K. Sharma, D. K. Dwivedi, "Sensitivity Evaluation of a Multi-Layered Blue Phosphorene/MoS2 Surface Plasmon Resonance based Fiber Optic Sensor: A Simulation Study", Transactions on Electrical and Electronic Materials (Springer), Vol. no. 23, 254-261, 2022, DOI: https://doi.org/10.1007/s42341-021-00344-x.
10. A. K. Pandey and Anuj K. Sharma, "On the application of MoS2 monolayer for enhanced performance in metallic grating based plasmonic sensor structure", Optical and Quantum Electronics (Springer), Vol. no. 54, 66, 2022, DOI: https://doi.org/10.1007/s11082-021-03428-3. (Impact Factor: 2.794)
11. Y. K. Prajapati, J. B. Maurya, and Anuj K. Sharma, "Tunable and Enhanced Performance of Graphene-Assisted Plasmonic Sensor with Photonic Spin Hall Effect in Near Infrared: Analysis Founded on Graphene's Chemical Potential and Components of Light Polarization" Journal of Physics D: Applied Physics (Institute of Physics, London), 55, 095102, 2022, DOI: https://doi.org/10.1088/1361-6463/ac37e0. (Impact Factor: 3.409)
12. V. A. Popescu, Anuj K. Sharma, and Y. K. Prajapati, "Graphene-Based Plasmonic Detection of Magnetic Field and Gaseous Medium with Photonic Spin Hall Effect in a Broad Terahertz Region", Journal of Electronic Materials, Vol no. 51, 2889–2899, 2022, DOI: https://doi.org/10.1007/s11664-022-09537-3. (Impact Factor: 2.047)
13. Anuj K. Sharma, P. Kumar, and Y. K. Prajapati, "Plasmonics-based gas sensor with photonic spin hall effect in broad terahertz frequency range under variable chemical potential of graphene", Optical and Quantum Electronics, Vol. no. 54, 328, 2022, DOI: https://doi.org/10.1007/s11082-022-03626-7. (Impact Factor: 2.794)
14. A. Ahmed, V. Kumari, G. Sheoran. Experimental Investigation of Microwave Holographic Reflectometry for Lung Tumor Detection. Measurement, 2022, 197(12):111336 (IF: 5.3)
15. H. Rout, S. S. Mohapatra, S. Shaw, V. S. Pandey, and M.K. Nayak, "Entropy optimized electrohydromagnetic rotating flow of nonNewtonian fluid with suspension of SWCNT/MWCNT nanomaterials: Modified Hamilton Crosser Model" Vol. 11, p. 1-16, Journal of Nanofluids (2022), ISSN: 2169432X. DOI: https://doi.org/10.1166/jon.2022.1815, DoP : 1st Feb 2022, Impact Factor = 1.966.
16. V. S. Pandey, A. Kumar and M. K. Nayak, "Transverse oscillations of the incompressible MHD mode in the visco-resistive plasmas: an explanation of Alfvénic to Landau-type characteristics" Monthly Notices of the Royal Astronomical Society (2022), Vol. 511 (01), p. 1349-1361, ISSN: 00358711, H index-383, https://doi.org/10.1093/mnras/stac100 DoP: 07th Feb. 2022, Impact Factor = 5.287.
17. L. Kumar, V. S. Pandey, H. Parthasarathy and V. Shrimali "Estimating the statistics of non-uniform and time varying distributed parameter fluctuations in a transmission line" Mapan-Journal of Metrology Society of India, Springer (2022), Accepted, ISSN:

09703950, https://doi.org/10.1007/s12647-022-00540, H-Index = 13, DoP: 17th March 2022, Impact Factor = 1.009.

18. P. Verma, V. S. Pandey, and A K Sharma, "Implementation and VariabilityAnalysis of Low Power Robust Muller C-element: LPRCE", Mapan; Springer (2022) Accepted, H-Index = 13, Impact Factor = 1.009.
19. P. Verma, A. K. Sharma, V. S. Pandey and A. Noor, "TSPC-HNTL: True Single Phase Clock Technique for High speed, Noise Tolerance, and Low Power" Analog Integrated Circuits and Signal Processing, Springer (2022), Accepted, ISSN: 09251030, H-index = 49, Impact Factor = 1.337.
20. V. S. Pandey, A. Kumar, M. K. Nayak, "The Role of Linearly Polarized Transverse MHD waves in heating the solar coronal plasma" Monthly Notices of the Royal Astronomical Society (2022), Accepted, ISSN: 00358711, H index-383, Impact Factor = 5.287.
21. R. Yadav, V. S. Pandey, S. Kumar and S. Gotra, "Obtaining Wide Bandwidth with Higher-order TM Modes Merging in a Graphene-based Logarithmic Antenna for THz Sensing Applications" Micro and Nanostructures (2022), Accepted, ISSN: 2773-0123, Impact Factor = 2.658.
22. Nishant Kumar, Davor Daniloski, Pratibha, Neeraj, Nathan M. D'Cunha, Nenad Naumovski, Anka Trajkovska Petkoska, "Pomegranate peel extract - A natural bioactive addition to novel active edible packaging", Food Research International (Elsevier), Volume 156, 111378, June 2022, https://doi.org/10.1016/j.foodres.2022.111378. (IF: 7.425)
23. Nishant Kumar, Pratibha, Neeraj, Rokayya Sami, Ebtihal Khojah, Amani H. Aljahani, Amina A. M. Al-Mushhin, "Effects of drying methods and solvent extraction on quantification of major bioactive compounds in pomegranate peel waste using HPLC", Scientific Reports (Springer Nature), 12, Article number: 8000, 2022, https://doi.org/10.1038/s41598-022-11881-7. (IF: 4.996)
24. Eeti Jain and Anurag Singh. "Trust- and reputation -based opinion dynamics modelling over temporal networks." Journal of Complex Networks 2022) 10.4): cnac019.
25. Anurag Singh and Md Arquam. "Epidemiological modeling for COVID-19 spread in India with the effect of testing." Physica A: Statistical Mechanics and its Applications 126774 :(2022) 592.
26. D Sethi, S Bharti, C. Prakash. "A comprehensive survey on gait analysis: History, parameters, approaches, pose estimation, and future work," Artificial Intelligence in Medicine, 2022, 102314, ISSN 0933-3657, https://doi.org/10.1016/j.artmed.2022.102314. (SCI, Impact factor 5.326)
27. MohitSajwan,AjayK.Sharma&KaranVerma, "IPRA: Iterative Parent-Based Routing Algorithm for Wireless Sensor Networks", Wireless Personal Communications volume 124, pages3321–3353, 2022, doi.org/10.1007/s11277-022-09515-2.
28. Anugrah Srivastava, Tapas Badal, Pawan Saxena, Ankit Vidyarthi, Rishav Singh, "UAV surveillance for violence detection and individual identification", Automated Software Engineering, 29, 2022, https://doi.org/10.1007/s10515-022-00323-3 (I.F 1.67)
29. Vartika Puri, Parmeet Kaur, Shelly Sachdeva, "(k, m, t)-anonymity: Enhanced privacy for transactional data", Concurrency and Computation: Practice and Experience, Vol 15, pp. 115-134, April 2022, 10: e7020, URL = https://doi.org/10.1002/cpe.7020.
30. Shelly Sachdeva, and Subhash Bhalla. "Using Knowledge Graph Structures for Semantic Interoperability in Electronic Health Records Data Exchanges." Information, Vol 13, no. 2, 2022, URL = https://doi.org/10.3390/info13020052.
31. Shelly Sachdeva, Monika Singh, Neeraj Kumar, and Puneet Goswami. "Personalized E-Learning Based on Ant Colony Optimization." International Journal of Uncertainty, Fuzziness and

Knowledge-Based Systems, Vol. 30, No. 01, pp. 115-134, 2022, URL = https://doi.org/10.1142/S0218488522500064.

32. Agrawal, K. A., Bharti, M., Kumar J.(2022). Channel Estimation of FBMC Aux, FBMC and OFDM based on BER and PAPR for 5G Systems. Indian Journal of Pure & Applied Physics (IJPAP), 60 (4), 320-324. Online ISSN: 0975-1041, Print ISSN: 0019-5596. Published April 20, 2022.
33. Pragya Gupta., Bharti, M., Anubhav Kumar (2022). CPW fed Four Element Diversity Antenna for UWB applications with Wi-Fi/ISM/WLAN Band Journal of Engineering Research (JER).DOI: https://doi.org/10.36909/jer.ICMET.17197, 1-14. Online ISSN: 2307-1885, Print ISSN: 2307-1877. Published April 06, 2022.
34. Sharma, A., Bahubalindruni, P. G., Bharti, M.,& Barquinha, P. (2022). Physical parameters based Analytical I-V model of a-IGZO TFTs. Solid State Electronics, Elsevier. DOI: https://doi.org/10.1016/j.sse.20220108273, 1-8. Online ISSN: 0038-1101. Published March 04, 2022.
35. Bharti, M. (2022). Performance Improvement using DCSRZ at 10GHz OCDMA Transmission Link. Journal of Enggineering Research (JER).DOI: https://doi.org/10.36909/jer.ICAPIE.15033, 177-184. Online ISSN: 2307-1885, Print ISSN: 2307-1877. Published March 16, 2022.
36. P. Agarwal, Sandeep Kumar, "Electroence -phalography-based imagined speech recognition using deep long short-term memory network " ETRI Journal, pp. 1-14, June 2022, DOI- https://doi.org/10.4218/etrij.2021-0118(Impact Factor- 1.622)
37. P. Agarwal and Sandeep Kumar, "Electroencephalography based imagined alphabets classification using spatial and time-domain features" International Journal of Imaging Systems and Technology (Wiley), pp. 111-122, vol- 32, no.1, 2022. DOI: https://doi.org/10.1002/ima.22655 (Impact Factor- 2.177)
38. P. Agarwal, Sandeep Kumar. Imagined word pairs recognition from non-invasive brain signals using Hilbert transform. Int J Syst Assur Eng Manag, Vol 13, no. 1, 385–394, 2022. https://doi.org/10.1007/s13198-021-01283-9
39. Preeti Mehta, Mahesh K. Singh, Nitin Singha, "Near-duplicate image detection based on wavelet decomposition with modified deep learning model," J. Electron. Imaging 31(2), pages=023017 (2022), doi: 10.1117/1.JEI.31.2.02301, (Impact Factor: 0.945).
40. Mahesh K. Singh and Nitin Singh Singha. "A relaxed Gaussian mixture model framework for terrain classification based on distinct range datasets." Remote Sensing Letters 13.5 (2022): 470-479, (Impact Factor: 2.583).
41. Suruchi Sharma, Rikmantra Basu, Baljit Kaur, "Temperature analysis of a dopingless TFET considering interface trap charges for enhanced reliability," IEEE Transaction on Electron Devices, vol. 69, issue 5, pp. 2692-2697, 2022. [Digital Object Identifier: 10.1109/TED.2022.3156895] (IF: 2.704), ISSN: 0018-9383, DOP: May 02, 2022.
42. A. Ranjani Aruna, Kamala J, Hanuman C R S, Dhandapani Vaithiyanathan, "Analysis Optimum Sizing of 12T PCSA for High Speed Soft Error Tolerant Logic Circuits Design", Journal of Electrical Engineering & Technology, Vol.,, pp.–. (Early Cite, SCIE Journal, Springer Publication, IF:1.528, ISSN: 2093-7423, DOI: 10.1007/s42835-022-01096-1)
43. Alok Kumar Mishra, D. Vaithiyanathan, Yogesh Pal, Baljit Kaur, "Design and Mathematical Analysis of a 7T SRAM Cell with Enhanced Read SNM using PMOS as Access Transistor", Circuit World, Vol.48, No.3, pp 322–332, 16 June 2022 (SCIE Journal, Emerald Publication, IF:1.027, ISSN: 0305-6120, DOI: https://doi.org/10.1108/CW-05-2020-0095)
44. G. Prabakaran, D. Vaithiyanathan, Madhavi Ganesan, "FPGA based Intelligent Embedded System for Predicting the Productivity Using Fuzzy Logic",

Sustainable Computing: Informatics and Systems, Vol.35, pp. 1–13, May 2022(SCIE Journal, Elsevier Publication,IF: 4.923, ISSN: 2210-5379, DOI: https://doi.org/10.1016/j.suscom.2022.100749)

45. Manigandan Muniraj and Vaithiyanathan Dhandapani, "Underwater image enhancement by color correction and color constancy via Retinex for detail preserving",Computers and Electrical Engineering, Vol.100, pp. 1–17, May 2022 (SCIE Journal, Elsevier Publication, IF: 4.152, ISSN: 0045-7906, DOI : https://doi.org/10.1016/j.compeleceng.2022.107909)
46. Alok Kumar Mishra, Urvashi Chopra and D. Vaithiyanathan, "A Partially Static High Frequency 18T Hybrid Topological Flip-Flop Design for Low Power Application", IEEE Transactions on Circuits and Systems II: Express Briefs, Vol. 69, No. 3, pp. 1592–1596, March 2022(SCIE Journal, IF: 3.691, ISSN: 1558-3791, DOI: 10.1109/TCSII.2021.3107684)
47. Ashish Mishra, Vaithiyanathan Dhandapani, Sachin Singh, Sanket Sonar and Alok Kumar Mishra, "Comparative Analysis of Preamplifiers for Comparators", Journal of Engineering Research (JER), ICAPIE Special Issue, pp. 50-59, March 2022 (SCIE Journal, IF: 1.325,ISSN: 2307-1877, DOI:https://doi.org/10.36909/jer.ICAPIE.15035)
48. Vaithiyanathan Dhandapani, Ashish Mishra, Ankit Kumar, Alok Kumar Mishra, Sachin Singh, Baljit Kaur, "Performance Analysis of a High-Speed High-Precision Dynamic Comparator", Indian Journal of Pure & Applied Physics (IJPAP), Vol. 60, No. 03, March 2022, pp.238–245 (SCIE Journal, IF: 0.846, ISSN: 0975-1041, DOI: http://op.niscair.res.in/index.php/IJPAP/article/view/56042/465480365)
49. Bharathi Raj Muthu, Ewins Pon Pushpa, Vaithiyanathan Dhandapani, Kamala Jayaraman, Hemalatha Vasanthakumar, Won-Chun Oh, Suresh Sagadevan, "Design and Analysis of Soft Error Rate in FET/CNTFET based Radiation hardened SRAM Cell", Sensors, Vol. 22, No. 01, January 2022, pp. 1-19 (SCIE Journal, MDPI Publication, IF: 3.847, ISSN: 1424-8220, DOI : https://doi.org/10.3390/s22010033)
50. Dharmendra Kumar Jhariya and Akhilesh Mohan, "Compact Ultrawideband Filter with Reconfigurable Band Notch Characteristics", International Journal of Electronics Letters (Taylor and Francis), Vol. no. 1, pp.1-11, 2022.https://doi.org/10.1080/21681724.2022 (Impact factor: 0.919)
51. Harshvardhan Kumar and Rikmantra Basu, "Design of Mid-Infrared Ge_{1-x} Sn_x Homojunction p-i-n Photodiodes on Si Substrate", IEEE Sensors Journal, Vol 22, Issue 8, pp. 7743-7751, April, 2022.(IF: 3.076). [Digital Object Identifier: 10.1109/jsen.2022.3159833] DOP: April 15, 2022.
52. Jaspinder Kaur, Rikmantra Basu and Ajay K Sharma, "PERFORMANCE ANALYSIS OF NITRIDE-BASED TUNNEL-INJECTION TRANSISTOR LASER", Journal of Russian Laser Research, Springer, Vol 43, no 3, pp. 361-369, May, 2022.(IF: 0.607). [Digital Object Identifier: 10.1007/s10946-022-10060-3] DOP: May 2022.
53. Jaspinder Kaur, Rikmantra Basu and Ajay K Sharma, "Design and Analysis of Si1-x-yGeySnx-Si1-xGex Alloy based Solar Cell emphasizing on Ge Composition 15%", Silicon Journal, Springer, Accepted] DOP: July 2022.
54. Mahesh K. Singh and Nitin S. Singha, "Relaxed Gaussian mixture model framework for terrain classification based on distinct range datasets," Remote Sensing Letters (TRSL), 13 and 5 470-479, 19-Feb-2022, DOI:10.1080/2150704X.2022.2038394 (Impact Factor: 2.583)
55. N. Singha, S. S.Kalamkar and Y. N.Singh, Maximum Utility-Aware Capacity Partitioning in Cooperative Computing, IEEE Communications Letters25 and 10 3360-3364, 01-Oct-2021, DOI: 10.1109/LCOMM.2021.3097045 (Impact Factor: 3.46)

56. M. Bajaj, A. K. Singh, "Increasing renewable energy penetration in harmonically polluted distribution grids using passive filtering: A comparative assessment of common filter types," Electrical Engineering, Springer Nature, 2022, https://doi.org/10.1007/s00202-022-01521-8, IF- 1.671.

57. M. Bajaj, A. K. Singh, "Optimal design of passive power filter for enhancing the harmonic-constrained hosting capacity of renewable DG systems," Computers & Electrical Engineering, ELSEVIER, Vol 97, 2022. https://doi.org/10.1016/j.compeleceng.2021.107646, IF- 4.152.

58. M. Bajaj and A. K. Singh, "Performance assessment of hybrid active filtering technique to enhance the hosting capacity of distorted grids for renewable energy systems," International Journal of Energy Research, 2022, Vol 46(3).(Wiley) https://doi.org/10.1002/er.7345, IF: 5.164.

59. Agarwal, A., Singh, N.K. & Kanumuri, T. "Device Modelling of CdTe Photovoltaic Cell Using V2O5/Cu2O/NiO as a Back Surface Field Layer Through Numerical Simulation". MAPAN (2022). https://doi.org/10.1007/s12647-021-00524-3. IF:1.446

60. Pawan Dubey, Tirupathiraju Kanumuri, R. Vyas, " Optimal directional texture codes using multiscale bit crossover count planes for palmprint recognition", Multimedia Tools and Applications, 11 March 2022, https://doi.org/10.1007/s11042-022-12580-1. IF: 2.577

61. Rinku Kumar, Pankaj Mukhija, and Manish Kumar Saini, "Consensus-Based Distributed Control in Microgrid Under Switching Topology", Emergent Converging Technologies and Biomedical Systems. Lecture Notes in Electrical Engineering, vol 841. Springer, Singapore, March 2022, ISBN: 978-981-16-8774-7.

62. Anshul Agarwal, Abhishek Awasthi, Vinay Kumar Jadoun & Ramesh C Bansal "Selective Harmonic Elimination in Space Vector Modulated AC-AC Converter Using FPGA" in Electric Power Components and Systems, Taylor & Francis, Volume 49 Issue 12-11, pp. 990–1006,13 Apr, 2022.

63. Shubham Kumar, Anshul Agarwal and Tirupathiraju Kanumuri "Power Quality Improvement of a Fuel Cell-Powered Filterless Distributed Generation System Using Sinusoidal Pulse Width Modulation" Indian Journal of Pure & Applied Physics (IJPAP), Vol. 60, June 2022.

64. Meena Pant, Leeladhar Nagdeve, Harish Kumar, Girija Moon, and Anuj Sharma (2022) "Tribological behavior investigation of 316L Stainless Steel specimens processed by Selective Laser Melting," Proceedings of the Institution of Mechanical Engineers, Part J: Journal of Engineering Tribology, DOI: 13506501221101797/10.1177, (SAGE Publication) IF=1.818.

65. Meena Pant, Leeladhar Nagdeve, Harish Kumar and Girija Moona (2022), A Contemporary investigation of additive manufacturing: Techniques, Applications, and Challenges" SADHANA, Vol. 47, Issue 1, Pages, 1-19 (Indian Academy of Sciences). DOI:10.1007/s12046-021-017706 (Springer), IF= 1.347.

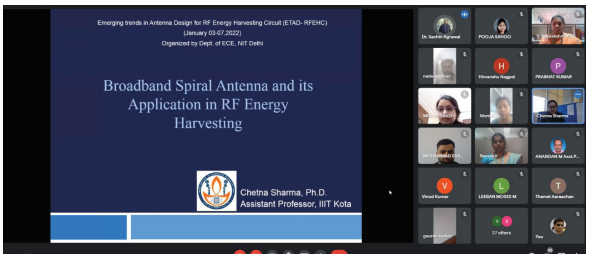
66. Jagannath Verma, Leeladhar Nagdeve and Harish Kumar (2022) Tribological investigations into Pin-on-Disc Tribometer under dry sliding condition at various temperature range, Proceedings of the Institution of Mechanical Engineers, Part E: Journal of Process Mechanical Engineering, Vol. 236 Issue 1, Pages -178 186, DOI: 09544089211042954/10.1177. (SAGE Publication), IF = 1.606.

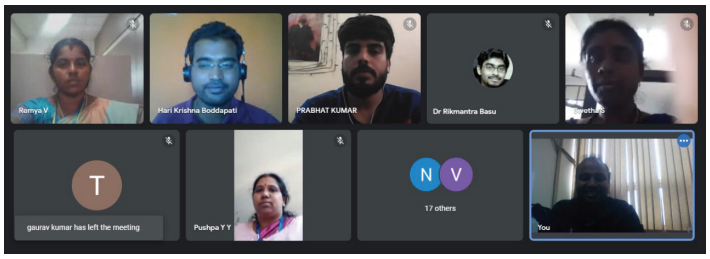
67. Girija Moona, Vinod Kumar, Mukesh Jewariya, Harish Kumar, Rina Sharma, "Measurement uncertainty assessment of articulated arm coordinate measuring machine for length measurement errors using Monte Carlo simulation," The International Journal of Advanced Manufacturing Technology, 119, 5903-5916,2022.

EXPERT TALKS/SEMINARS/FDP/CONFERENCE/OTHER EVENTS ORGANIZED

One Week Online Self-Sponsored Short-Term (STC) Course on "Emerging Trends in Antenna Design for RF Energy Harvesting Circuit (ETAD- RFEHC)" January 03-07, 2022 (Convener: Dr. Rikmantra Basu)

The aim of this short term course, organized by ECE Department of NIT Delhi, was not only to facilitate the participants regarding modern technological aspects/developments in various fields of ultramodern antenna design but also to provide an insight into how to do research in the above areas along with disciplined focus in the demanded area of RF energy harvesting for various socio-economic applications. Special emphasis was given for the research challenges in designing the practical circuits and device analysis in the above mentioned area from industry point of view. Virtual hands on sessions on device/circuits simulators were also organized to facilitate more practical knowledge to the participants towards the design and development of real products. It included 12 lectures/expert talk sessions and virtual training sessions distributed among 5 days with the expert talks by academia and industry persons. More than 80 participants from various working/teaching/research professions attended this online STC.

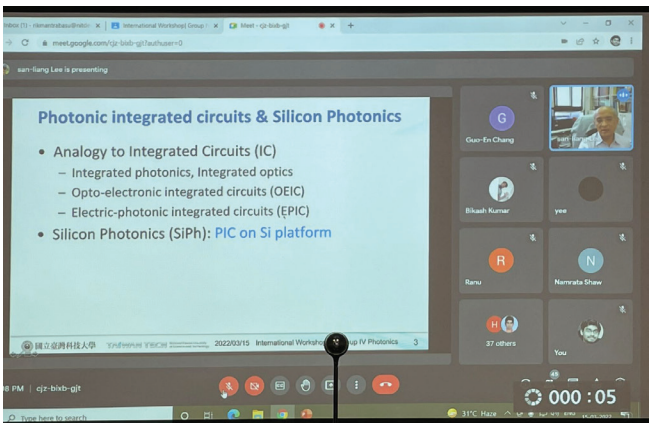




6-Days Online IEEE International workshop on "Group IV Photonics" March 15-20, 2022, Organized by- ECE Department, NIT Delhi with IEEE Photonics Society – Delhi Section (Rajasthan Chapter) and IEEE NITD Student Branch and AMIN-HI, National Chun-Cheng University, Taiwan (Convener: Dr. Rikmantra Basu)

The aim of this International Workshop cum Tutorial was to discuss the basic physics of materials, growth technology, principle of operation of basic photonic devices: both active and passive, current state-of-the-art technology employed by manufacturers, and current and envisaged future system applications in the field of Group-IV material based technologies. Special emphasis was given for short-oral presentations and competitions among young researchers/ PhD scholars working in this field to showcase their innovative ideas. The ECE Department of NIT Delhi, Advanced Institute of Manufacturing with High-tech Innovations (AIM-HI) and

College of Engineering (CoE) of National Chung-Cheng University, Taiwan jointly organized the workshop. This was NIT Delhi's first IEEE sponsored event/workshop, where technical sponsors were IEEE Photonics Society-Delhi Section (Rajasthan Chapter) and IEEE Taiwan Section. More than 80 participants from various working/teaching/research professions attended this online workshop, among which many are international participants across various countries of the globe.



One Week FDP on "Modern Trends in Manufacturing and Thermal Sciences (MTMTS-2022)" during April 5-10, 2022.

The purpose of this FDP was to disseminate the scientific knowledge in the field of hybrid processes (Manufacturing and Thermal), to serve as a platform for demonstrating research oriented outcomes with their implementations in the real applications. This FDP has emphasized the gap between research and actual practice, and cover applications of technologies which present new insights, innovative modelling techniques and novel optimization methodologies associated with hybrid processes.

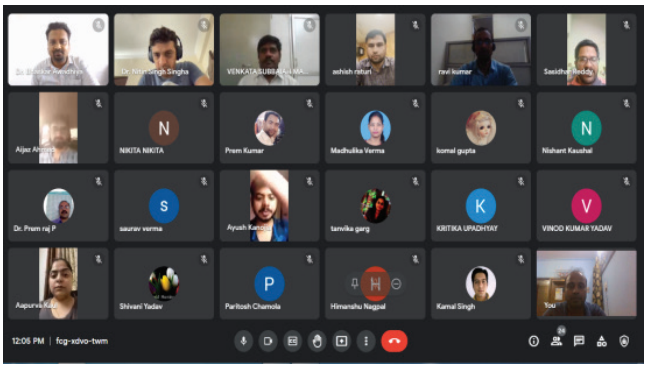
Research/Expert talks organized by CSE Department.

i. Title: Distributed and Federated Machine Learning, Dr. Bapi Chatterjee, Assistant Professor, IIIT-Delhi (21 April 2022)
ii. Title: Time-frequency and Geometric Analysis of Task-dependent Learning in Raw Waveform based Acoustic Models, Dr. Vinayak Abrol, Assistant Professor, IIIT-Delhi (21 April 2022)
iii. Seminar on Intellectual Property Rights (IPR) Awareness under "National Intellectual Property Awareness Mission (NIPAM)" 05 May 2022

On May 13, 2022, an Expert Talk was delivered by Dr. Sunanda Jha, Assistant Professor, Centre for Energy and Environment, Malaviya National Institute of Technology Jaipur, Rajasthan on Futuristic PV (Photo-Voltaic) Applications in celebration of International Light Day 2022, contributing to Azadi Ka Amrit Mahotsav, the 75th Anniversary of Indian Independence. ECE Department of NIT Delhi convened this expert talk.

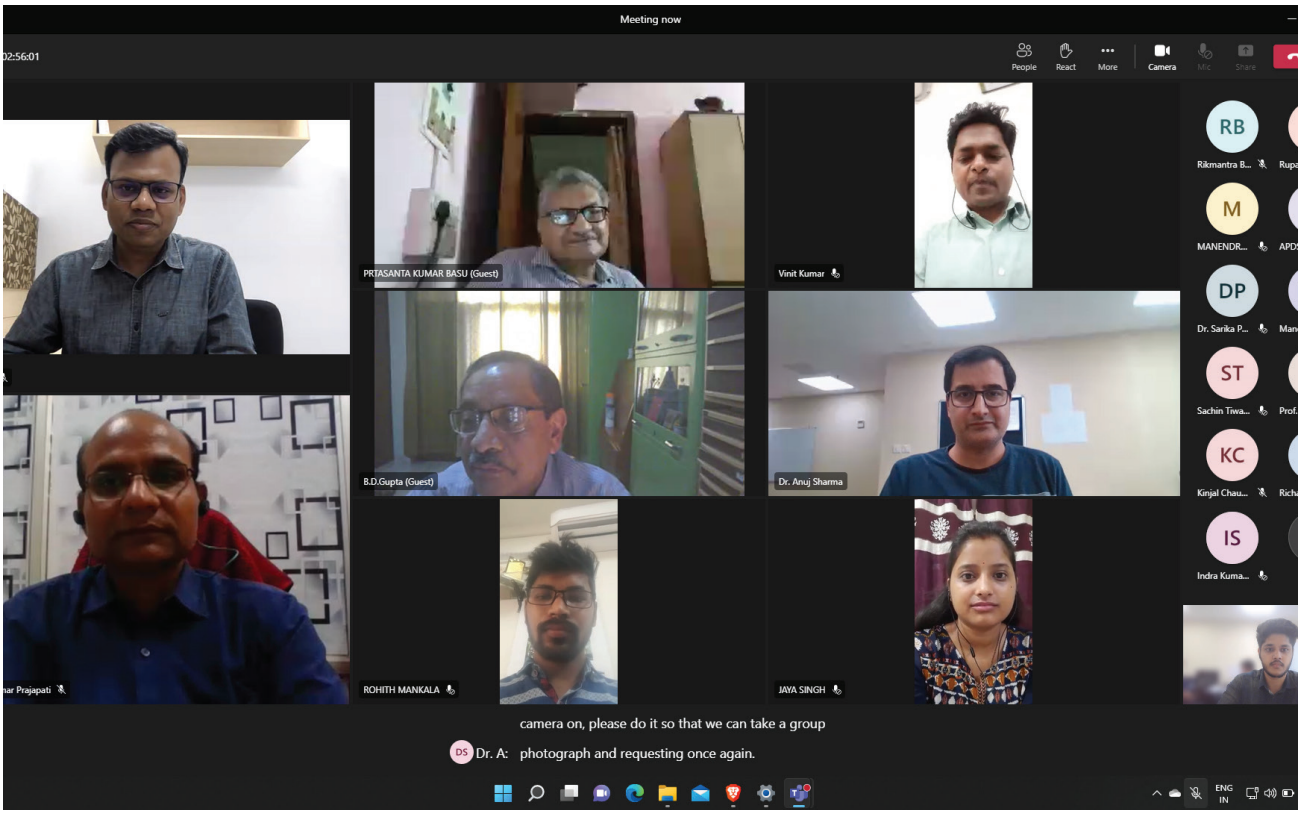
Online One-week short term program on VLSI Design and communication system, May 23-28, 2022 (Coordinators- Dr Sachin Agarwal & Dr Nitin Singh Singha)

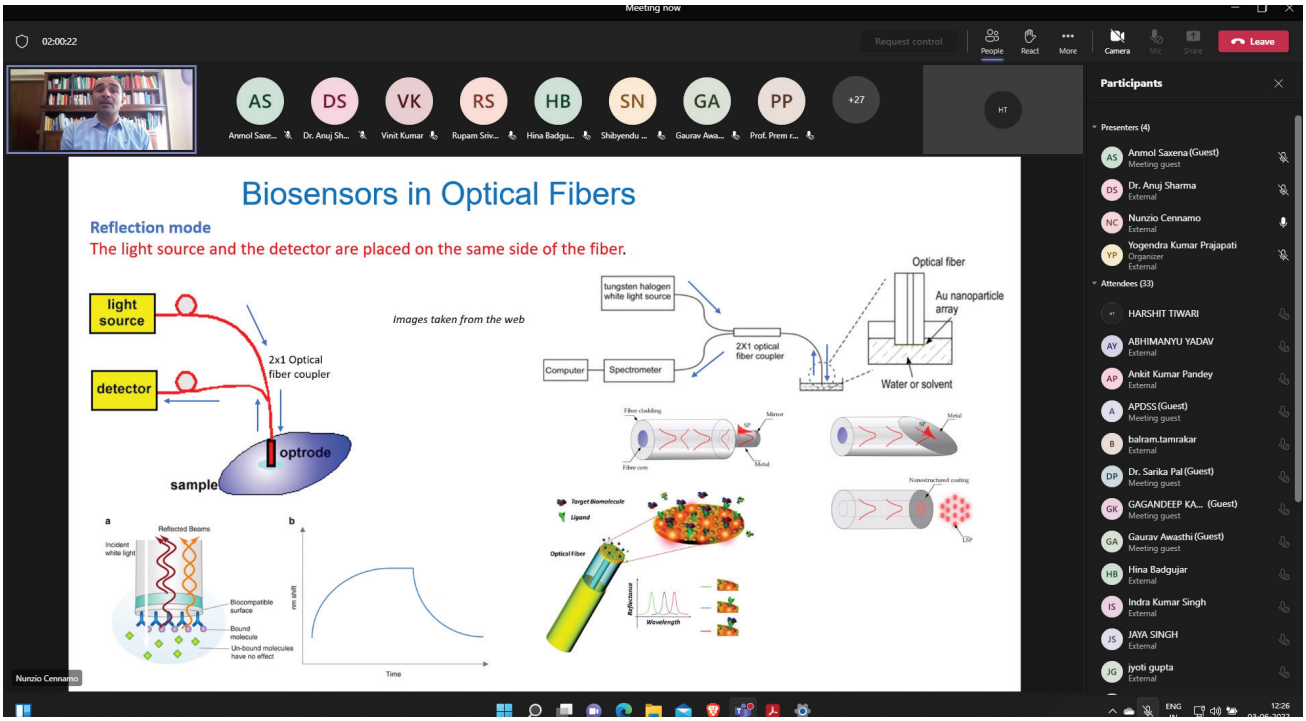
Total 12 sessions were delivered by experts from different organizations like MANIT Bhopal, NIT Patna, NIT Jalandhar, and Delhi Technological University. More than 80 participants including M.Tech students and PhD scholars attended the program from various institutes throughout the country. All the sessions were conducted through online mode. The course was free for all the participants.



2-days online workshop on Advances in Photonic Devices, Sensors, and Systems (APDSS) during June 2-3, 2022 under the Scientific Social Responsibility (SSR) scheme of the Science and Engineering Research Board (SERB) India. (Coordinator: Dr. Anuj Kumar Sharma)

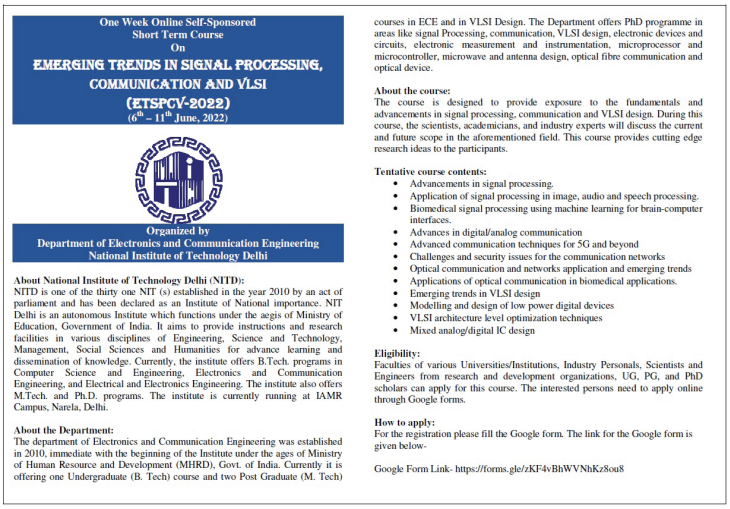
This two-days' workshop, attended by more than 75 participants all over India, had attempted to organize talks from eminent experts from multi-disciplinary research areas working in different organizations worldwide including India, Canada, and Italy. The participants were exposed to a large variety of advancements that have taken place in the area of photonic devices, sensors, and systems with strong emphasis on the research areas such as fiber optics, optical communication, opto-electronics, and biomedical optics.





One Week Online Short-Term Course on Emerging Trends in Signal Processing, Communication and VLSI (ETSPCV-2022), June 06-11, 2022 (Coordinators: Dr. Sandeep Kumar and Dr. Manisha Bharti)

The aim of this short-term course was to facilitate the participants about modern technological aspects/developments in the field of Signal Processing, Communication and VLSI and provide an insight into the research activities in the above areas along with disciplined focus for various real-life applications. Special emphasis was given for the research challenges and advancement in the aforementioned fields and their applications. 112 participants from various working/teaching/research professions attended the online STC. Apart from the outside participants, the ECE department also made an effort to involve the M.Tech. and Ph.D. students of ECE and ECE (VLSI) design streams aimed at enhancing their technical and professional skills.



One Week Online Self-Sponsored
Short Term Course
On
EMERGING TRENDS IN SIGNAL PROCESSING, COMMUNICATION AND VLSI
(ETSPCV-2022)
(6th – 11th June, 2022)

Organized by
Department of Electronics and Communication Engineering
National Institute of Technology Delhi

About National Institute of Technology Delhi (NITD):
NITD is one of the thirty one NIT (s) established in the year 2010 by an act of parliament and has been declared as an Institute of National importance. NIT Delhi is an autonomous Institute which functions under the aegis of Ministry of Education, Government of India. It aims to provide instructions and research facilities in various disciplines of Engineering, Science and Technology, Management, Social Sciences and Humanities for advance learning and dissemination of knowledge. Currently, the institute offers B.Tech. programs in Computer Science and Engineering, Electronics and Communication Engineering, and Electrical and Electronics Engineering. The institute also offers M.Tech. and Ph.D. programs. The institute is currently running at IAMR Campus, Narela, Delhi.

About the Department:
The department of Electronics and Communication Engineering was established in 2010, immediate with the beginning of the Institute under the ages of Ministry of Human Resource and Development (MHRD), Govt. of India. Currently it is offering one Undergraduate (B. Tech) course and two Post Graduate (M. Tech) courses in ECE and in VLSI Design. The Department offers PhD programme in areas like signal Processing, communication, VLSI design, electronic devices and circuits, electronic measurement and instrumentation, microprocessor and microcontroller, microwave and antenna design, optical fibre communication and optical device.

About the course:
The course is designed to provide exposure to the fundamentals and advancements in signal processing, communication and VLSI design. During this course, the scientists, academicians, and industry experts will discuss the current and future scope in the aforementioned field. This course provides cutting edge research ideas to the participants.

Tentative course contents:
- Advancements in signal processing.
- Application of signal processing in image, audio and speech processing.
- Biomedical signal processing using machine learning for brain-computer interfaces.
- Advances in digital/analog communication
- Advanced communication techniques for 5G and beyond
- Challenges and security issues for the communication networks
- Optical communication and networks application and emerging trends
- Applications of optical communication in biomedical applications.
- Emerging trends in VLSI design
- Modelling and design of low power digital devices
- VLSI architecture level optimization techniques
- Mixed analog/digital IC design

Eligibility:
Faculties of various Universities/Institutions, Industry Personals, Scientists and Engineers from research and development organizations, UG, PG, and PhD scholars can apply for this course. The interested persons need to apply online through Google forms.

How to apply:
For the registration please fill the Google form. The link for the Google form is given below-

Google Form Link- https://forms.gle/zKF4vBhWVNhKz8ou8

FDP on "Future Perspective of Sustainable Environment and Climate Change (SECC-2022)" (Conveners: Dr. Kapil Kumar and Dr. Prashant Kumar)

Department of Applied Sciences conducted the e-Faculty Development Programme (FDP) on "Future Perspective of Sustainable Environment and Climate Change (SECC-2022)" with OSI-Delhi-NCR Chapter (as technical partner) during June 14-19, 2022. The FDP aimed at providing an interactive platform to the academia, researchers and students who are working in the latest developments of sustainable environmental problems and issues related to climate change. Further, the FDP focused on covering various aspects of wastewater treatment, multicomponent biological waste water treatment. The FDP further aimed to discuss future perspectives of sustainable development as per the guidelines of Intergovernmental Panel for Climate Change (IPCC) under the different emission scenario.

7th International Conference on Advanced Production and Engineering Industrial (ICAPIE-2022) jointly organized by DTU, CAPIER, and Department of Mechanical Engineering, NIT Delhi at NIT Delhi, INDIA during June 11-12, 2022.

The main aim of the conference was to promote in-depth analysis and scholarly discussion on major themes such as Design, Materials, Manufacturing and others while emphasizing the importance of relatively new and emerging areas such as product Design, Graphics Design, Sustainable Manufacturing, Nano-material Sciences, Green supply chain management, and so on.

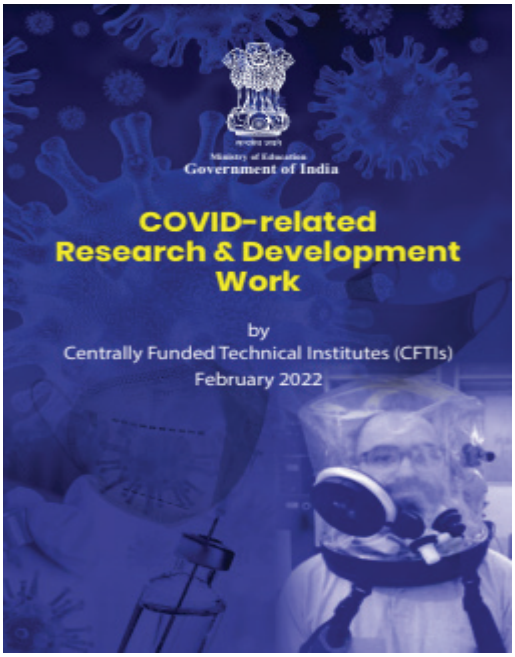
Workshop on "Design, Test and validate, Power Electronics, E-mobility, Renewables, Microgrid using Typhoon HIL" organized by Electrical Engineering Department during June 27-July 2, 2022.

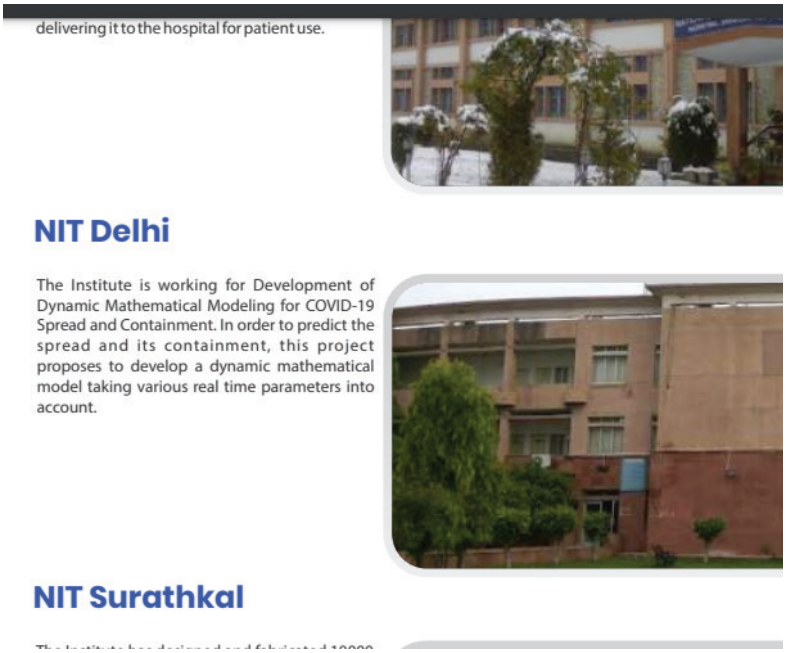
NEWS COVERAGE OF THE INSTITUTE'S RESEARCH ACTIVITIES

- **Press Coverage of Dr. Anurag Singh's research work**

Dr. Anurag Singh's MATRICS project (funded by SERB, India) entitled "Development of Dynamic Mathematical Modeling for COVID-19 Spread and Containment" has been highlighted in a report on "COVID-related Research & Development Works done by Centrally Funded Technical Institutes (CFTIs)" released by the Ministry of Education, Government of India in February 2022.

(URL: https://owncloud.iitd.ac.in/nextcloud/index.php/s/SwEF7Nfoon4MYMQ)





- **Press Coverages of Dr. Prashant Kumar's collaborative research work**

Ministry of Science & Technology

Azadi Ka Amrit Mahotsav

High wave activity in regions over Bay of Bengal, South China Sea, & South Indian Ocean can pose threat for coastal communities

Posted On: 04 FEB 2022 2:36PM by PIB Delhi

- Study performed a detailed investigation on future extreme wind-wave projections
- Its relationship with wind speed, sea level pressure, and sea surface temperature studied
- New findings provide scope for a detailed investigation on the possible linkages and teleconnection with climate indices in a changing climate

A recent study conducted by Indian Scientists has indicated that regions over Bay of Bengal, South China Sea, and South Indian Ocean can experience higher wave activity in the future, posing serious threat for coastal communities in the region.

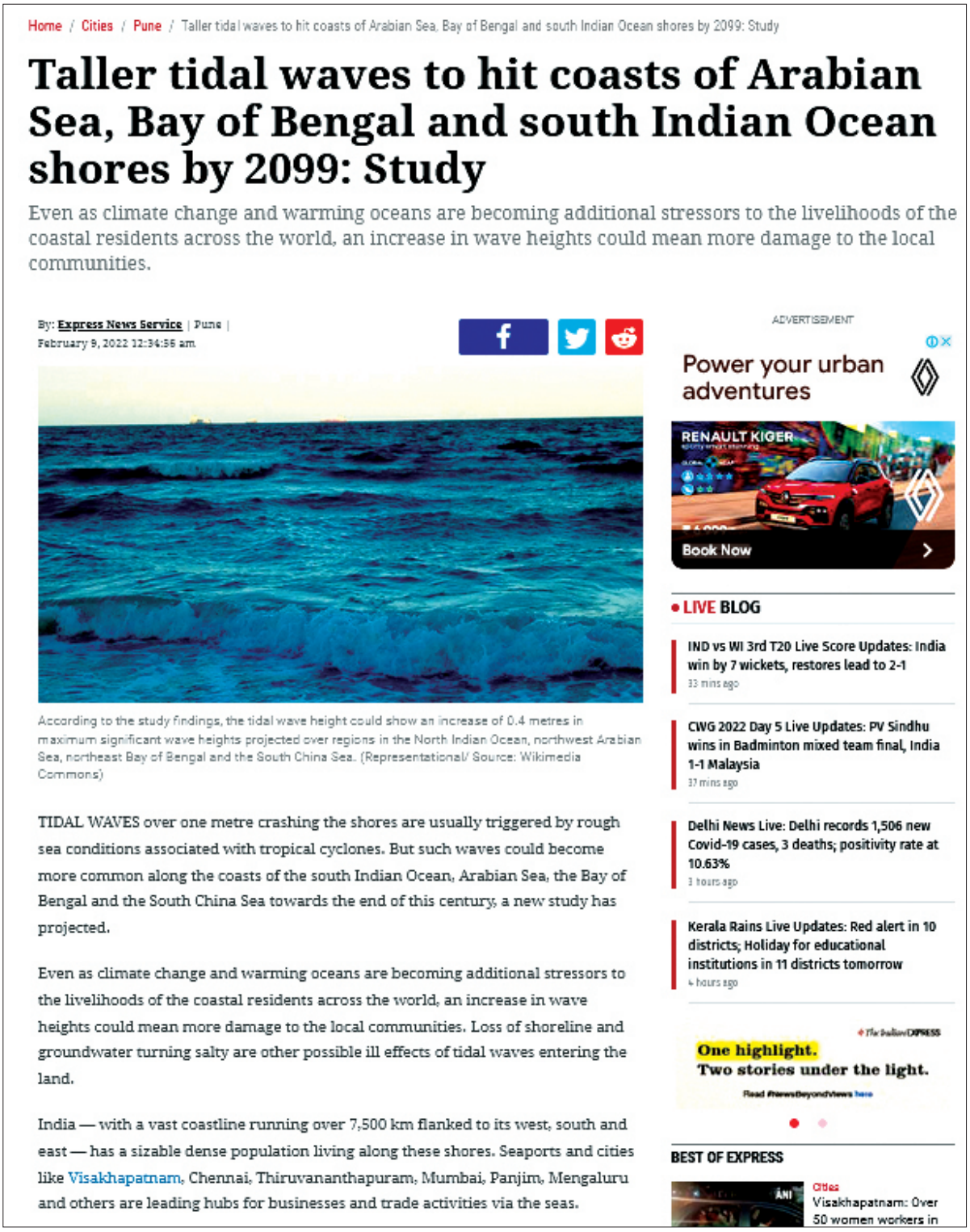
Coastal communities are one of those most vulnerable to impacts of climate change and other environmental drivers due to their exposure to severe inundation and its frequency associated with extreme water levels in the nearshore regions. Impact resulting from coastal inundation can significantly affect the shoreline configuration, damage to infrastructure, saltwater intrusion into groundwater, destruction of crops, and affect the human population with a range of socio-economic consequences. Scientists around the world are trying the estimate the magnitude of this impact.

The present study performed a detailed investigation on future extreme wind-wave projections and its relationship with wind speed, sea level pressure, and sea surface temperature for the mid-and end-century under two different greenhouse gas emission scenarios projected by the Intergovernmental Panel on Climate Change (IPCC) called RCP4.5 and RCP8.5.

Analysis of the projections have indicated maximum extreme wind and wave activity over the South Indian Ocean region during June-July-August and September-October-November. Regions over the central Bay of Bengal show extreme wind activity from the end-century projections, signifying the likelihood for more extreme events. Extreme wave heights are seen to intensify by about 1 m over the South Indian Ocean during the June-July-August months. An increase of 0.4 m in maximum significant wave heights are projected over regions in the North Indian Ocean, northwest Arabian Sea, northeast Bay of Bengal, and South China Sea.

A team of scientists Athira Krishnan and Prasad K. Bhaskaran from the Department of Ocean Engineering & Naval Architecture, IIT Kharagpur, jointly with Prashant Kumar, Department of Applied Sciences, National Institute of Technology Delhi with the support from the Department of Science & Technology, Government of India under the Climate Change Programme (CCP), carried out this study which was published in the journal 'Climate Dynamics', Springer recently.

A collaborative research work of Dr. Prashant Kumar (Applied Sciences Department) on "High wave activity in regions over Bay of Bengal, South China Sea, & South Indian Ocean can pose threat for coastal communities" has been cited by Press Information Bureau (PIB) of India, Department of Science and Technology, Government of India (February 2022). The study had focused on future extreme wind-wave projections with scenarios for around 2050s and 2090s were presented. Above work of Dr. Prashant Kumar has also been covered by as many as 12 news outlets across India including The Indian Express, The Pioneer, Weekly Voice, and News Kerala etc.



Home / Cities / Pune / Taller tidal waves to hit coasts of Arabian Sea, Bay of Bengal and south Indian Ocean shores by 2099: Study

Taller tidal waves to hit coasts of Arabian Sea, Bay of Bengal and south Indian Ocean shores by 2099: Study

Even as climate change and warming oceans are becoming additional stressors to the livelihoods of the coastal residents across the world, an increase in wave heights could mean more damage to the local communities.

By: Express News Service | Pune | February 9, 2022 12:34:56 am

According to the study findings, the tidal wave height could show an increase of 0.4 metres in maximum significant wave heights projected over regions in the North Indian Ocean, northwest Arabian Sea, northeast Bay of Bengal and the South China Sea. (Representational/ Source: Wikimedia Commons)

TIDAL WAVES over one metre crashing the shores are usually triggered by rough sea conditions associated with tropical cyclones. But such waves could become more common along the coasts of the south Indian Ocean, Arabian Sea, the Bay of Bengal and the South China Sea towards the end of this century, a new study has projected.

Even as climate change and warming oceans are becoming additional stressors to the livelihoods of the coastal residents across the world, an increase in wave heights could mean more damage to the local communities. Loss of shoreline and groundwater turning salty are other possible ill effects of tidal waves entering the land.

India — with a vast coastline running over 7,500 km flanked to its west, south and east — has a sizable dense population living along these shores. Seaports and cities like Visakhapatnam, Chennai, Thiruvananthapuram, Mumbai, Panjim, Mengaluru and others are leading hubs for businesses and trade activities via the seas.

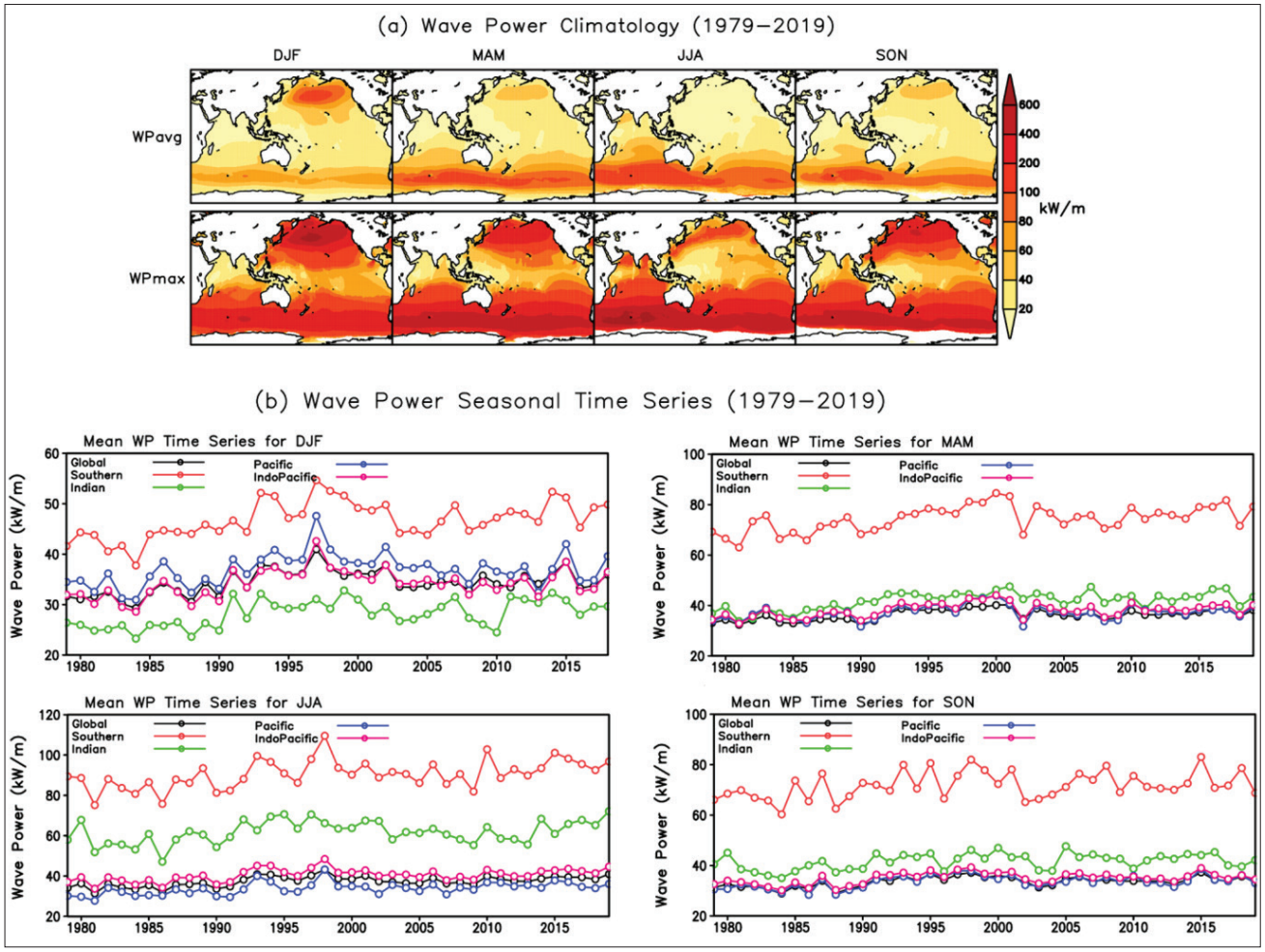
LIVE BLOG
IND vs WI 3rd T20 Live Score Updates: India win by 7 wickets, restores lead to 2-1
33 mins ago
CWG 2022 Day 5 Live Updates: PV Sindhu wins in Badminton mixed team final, India 1-1 Malaysia
37 mins ago
Delhi News Live: Delhi records 1,506 new Covid-19 cases, 3 deaths; positivity rate at 10.63%
3 hours ago
Kerala Rains Live Updates: Red alert in 10 districts; Holiday for educational institutions in 11 districts tomorrow
4 hours ago

BEST OF EXPRESS
Cities
Visakhapatnam: Over 50 women workers in

RECENTLY AWARDED EXTERNALLY FUNDED RESEARCH PROJECTS

Research Project Title	:	Projection of Wave Power in Indian Ocean and its Utilization along the Coastal Regions
Funding agency	:	Science and Engineering Research Board (SERB), India
Name of faculty member	:	Dr. Prashant Kumar
Name of the department	:	Applied Sciences, NIT Delhi

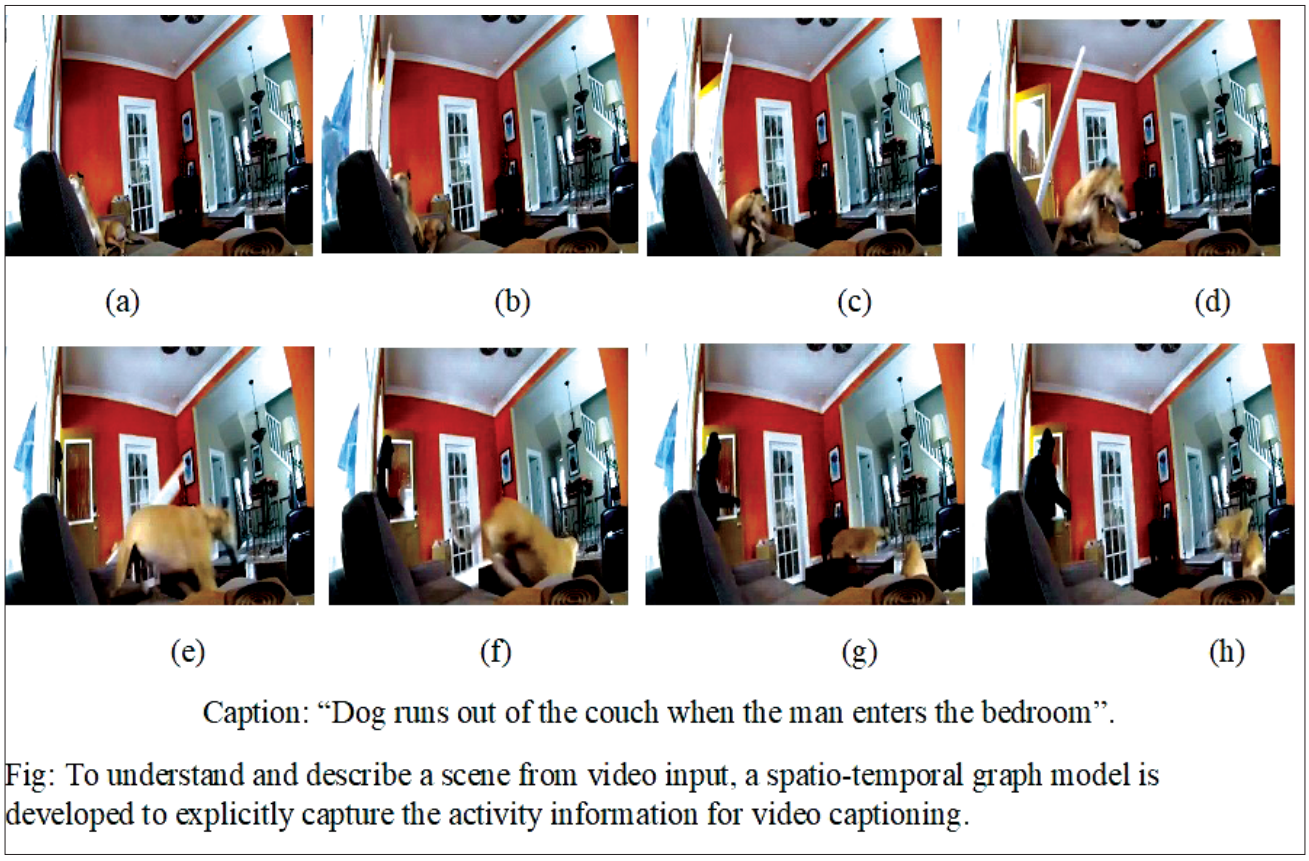
Brief summary of the research work: Extreme surface ocean waves can have substantial contribution to coastal flooding, offshore structure such as harbors destructions and coastal sea level extremes. Usually, the extreme ocean wave heights are generated by surface windgust energy. The tropical coastal region of East Asia and U.S. coastline is severely affected by several typhoon and hurricanes which generates extreme ocean wave height. Therefore, the ocean wave height plays an important role in the climate system and it could be affected by anthropogenic forcing. For example, the increasing global trends of wind speed and wave height based on satellite data have been observed.



The research team led by Dr. Prashant Kumar has been working on to detect the human influence on the North Atlantic Ocean wave height and atmospheric storminess.

Research Project Title	:	Captioning the Extracted events of the Scene from the Video through Spatio-Temporal Graph Model
Funding agency	:	Technical Innovation Hub (TIH), IIT Patna
Name of faculty member (s):		Dr. Anurag Singh (PI), Dr. Mahesh K Singh (Co-PI)
Name of the department (s):		CSE (PI), ECE (Co-PI), NIT Delhi

Brief summary of the research work: Natural scenes are complex, not only because of the large set of attributes involved, but also the complicated interconnections among them. With advancements made in the video and language domains, it is possible to classify the videos into a discrete set of activities. The video captioning methods are used to understand distinct scenes that generate text descriptions from an input video.



Caption: "Dog runs out of the couch when the man enters the bedroom".

Fig: To understand and describe a scene from video input, a spatio-temporal graph model is developed to explicitly capture the activity information for video captioning.

In this ongoing project, the research team consisting of Dr. Anurag Singh (CSE Department) and Dr. Mahesh Singh (ECE Department) is developing a video understanding model by acquiring spatial-temporal information which describes activities in the video content through natural language sentences.

RECENTLY AWARDED CONSULTANCY PROJECTS

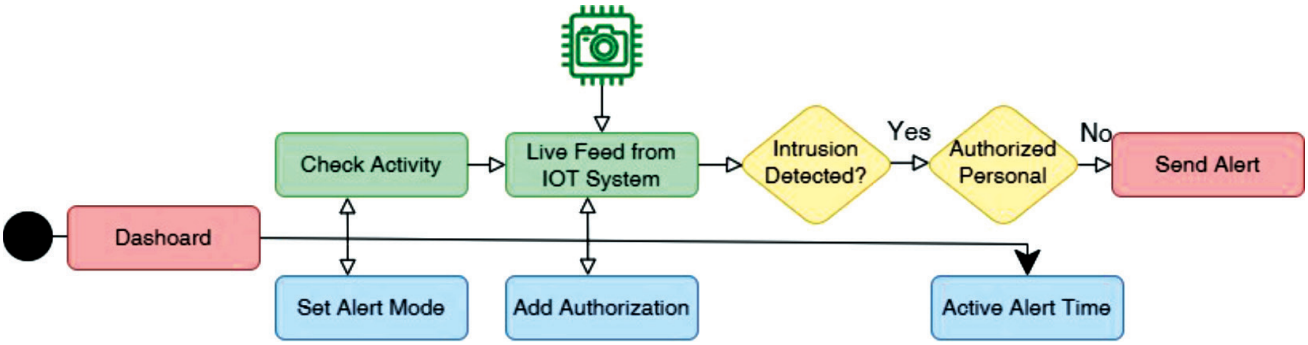
Consultancy Project Title : Real-time human surveillance

Funding organization : Imagenous Engineering Pvt. Ltd. India

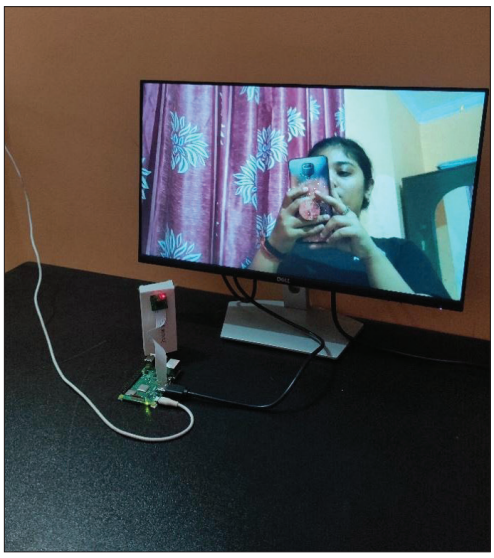
Name of faculty member : Dr. Rishav Singh

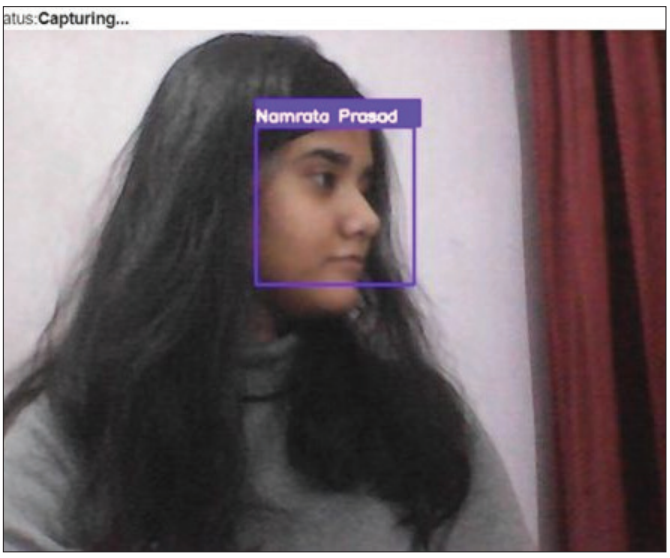
Name of the department : CSE, NIT Delhi

Brief summary of the research work: This consultancy project is divided into two parts parts: (i) to detect and identify human during intrusion and notify the concerned authorities, and (ii) Human intrusion detection in a zone where humans are not permitted for a specific period of time.



The entire study comprises three major parts. First, Human Detection and Tracking using state-of-the-art Artificial Intelligence (AI) methodologies where feature-based human recognition is utilized to improve the accuracy. Second, creating a Web Application with object detection and facial recognition models. It supports multiple features such as authorization through face recognition, live cam feed, changing communication mode, and set alert period. Third, developing the IoT system using Raspberry Pi to capture pictures and videos of human beings in real-time, which will send alerts simultaneously alerting the owner of the system about the intrusion and a mobile-based user interface using which the owner can remotely track the activity.





BOOKS PUBLISHED

1. Debi Prasad Mishra, Ashok Kumar Dewangan, and Achhaibar Singh "Recent Trends in Thermal and Fluid Sciences" Selected proceedings of the International Conference on Mechanical Engineering (INCOME 2021), Springer, 2022, ISBN: 978-981-19-3497-1.
2. P. K. Basu, B. Mukhopadhyay and Rikmantra Basu, "Semiconductor Nanophotonics", Oxford University Press, UK, April 2022. ISBN: 978-0-19-878469-2 DOI: 10.1093/oso/9780198784692.001.0001

BOOK CHAPTERS PUBLISHED

1. Ashwini Shrivastava, Devendra Singh, Ajay Kumar Sharma, Ashok K. Dewangan, "*Design and Performance Analysis of a Wick-Type Solar Distillation Unit*", Advances in Mechanical and Materials Technology, Lecture Notes in Mechanical Engineering, Springer, 2022, (ISBN: 978-981-16-2794-1, DOI: 10.1007/978-981-16-2794-1_99).
2. Amit Kumar Singh, S. Agrawal, S. Agarwal, D. Goyal, "*Low-Cost and Energy-Efficient Smart Home Security and Automation*". In: Pant M., Sharma T., Basterrech S., Banerjee C. (eds) "Computational Network Application Tools for Performance Management". Asset Analytics Book Series. Springer, 2019, pp. 95-108. Online ISBN: 978-981-32-9585-8.
3. Suruchi Sharma, Rikmantra Basu, Baljit Kaur, "*Performance Investigation of a Novel Si/Ge Heterojunction Asymmetric Double-Gate DLTFET for Low-Power Analog/RF and IoT Applications*" in Sub-Micron Semiconductor Devices, CRC Press, 2022 (ISBN: 9781003126393).
4. Venkata Nikitha Machineni, Korada Sri Vardhana and Vaithiyanathan Dhandapani, "*Data Driven approach to achieve coordinated charging among electric vehicles*", Advances in Electrical and Computer Technologies. Lecture Notes in Electrical Engineering, Vol. 881, pp. 771-779, 26 June 2022, Springer, Singapore. (Scopus Index, ISBN: 978-981-19-1110-1, DOI: https://doi.org/10.1007/978-981-19-1111-8_59)
5. Vaithiyanathan Dhandapani, Joel Jacob Thomas and Y. Durga Sravanthi, "*Integrated Smart Alert System for Industrial Applications using Transceiver Module Analysis*", Advances in Electrical and Computer Technologies. Lecture Notes in Electrical Engineering, Vol. 881, pp. 647-663, 26 June 2022, Springer, Singapore. (Scopus Index, ISBN: 978-981-19-1110-1, DOI: https://doi.org/10.1007/978-981-19-1111-8_49)
6. Yuvaraj S, Manigandan M, Vaithiyanathan Dhandapani, Saajid R and Nikhilesh S, "*Internet of Things Integrated with Multi-level Authentication for Secured IoT Data Stream through TLS/SSL Layer*", Big-Data-Analytics in Astronomy, Science, and Engineering. BDA 2021. Lecture Notes in Computer Science, Vol. 13167, 18 February 2022, pp. 245-258, Springer, Cham. (Scopus Index, ISBN: 978-3-030-96600-3, DOI: https://doi.org/10.1007/978-3-030-96600-3_18)
7. L. Kumar, V. S. Pandey, H. Parthasarathy and V. Shrimali, "*Quantum, Stochastic and Nonlinear Aspects of transmission lines and wave Guides*", Manakin Press, ISBN: 978-93-92062-05-6, (2022).

EXPERT TALKS DELIVERED AND CONFERENCE PAPERS PRESENTED

Faculty Member (s)	Name and place of Event	Duration	Topic of talk
Dr. Shelly Sachdeva (CSE)	AICTE sponsored Faculty Development Program Guru Jambeshwar Univ. Hisar	January 03-08, 2022	Machine Learning for Internet of Things
	12th International Conference on Cloud Computing, Data Science & Engineering Amity University, Noida	January 27-28, 2022	Vedic Science to Metaverse
Dr. Anuj K. Sharma (Physics)	ATAL FDP on "Photonics and its Applications" SVNIT Surat, India	February 14-18, 2022	Plasmonics-based sensors and photodetectors in a wide spectral range
Dr. Anurag Singh (CSE)	NIT Meghalaya	May 27, 2022	Game Theory and its Applications
	2022 8th International Conference on Advanced Computing and Communication Systems (ICACCS). Organized by Sri Eshwar College of Engineering, Coimbatore, Tamilnadu, India.	March 25, 2022	Quantum Walk Circuits to Analyze Networks
	Three-Day 5th International Conference on , "Recent Advances in Mathematical Sciences with Applications in Engineering and Technology" (IC-RA-MSA-ET-2022) on the occasion of Golden Jubilee Celebration of Vijnana Parishad of India (Society for Applications of Mathematics)	June 16, 2022	Spectral Graph Theory
Dr. Chandra Prakash (CSE)	AICTE-sponsored 5-Day FDP on "COMPUTER VISION & IMAGE PROCESSING" at J.C. Bose University of Science & Technology, YMCA, Faridabad	June 3, 2022	Transfer Learning and Computer vision
	LPU Punjab	March 24, 2022	Deep Reinforcement Learning
	"Applied AI and Natural Language Processing" at Bennett University, Greater Noida	March 10, 2022	Learning in human way: Deep Reinforcement Learning
	"Current Trends and Future Prospects in Data Science" (Sponsored by AICTE Training And Learning (ATAL) Academy), Central University of Rajasthan	January 12, 2022	Reinforcement Learning Based Text Summarization Techniques
	AICTE ISTE sponsored Induction/Refresher program (1-week) on "Artificial intelligence and Deep Learning", RIET Jaipur	January 10, 2022	CNN and Computer vision
	FDP on "Deep Learning and Computer vision" at Manipal University Jaipur	January 3-7, 2022	CNN Learning and Image Processing
Dr. Karan Verma (CSE)	FDP on IoT: Challenges & Applications Sharda University, Geater Noida, UP	June 20-24, 2022	5G Security
	FDP on Emerging trends in Data Analytics, Machine Learning, Cloud Computing and Internet of Things	May 23-27, 2022	Cloud Computing
	FDP on Wireless Sensor Networks and IoT, DTU	January 10-14, 2022	IoT Applications
Dr. Rishav Singh (CSE)	SRM Institute of Science and Technology, Chennai	June 6, 2022	Federated Learning in Healthcare

Dr. Manisha Bharti (ECE)	Guest Lecture at Department of ECE, ABES Engineering College, Ghaziabad.	May 19, 2022	Advanced Optical Networks
	National Workshop on Emerging Trends in Electronics Engineering at MIET, UP, India	May 6, 2022	Importance of Cadence, HFSS & Tools in Electronics
	International Conference on Advanced Production and Industrial Engineering ICAPIE-2022, organized by DTU Delhi.	June 11, 2022	Performance Analysis of WDM-PON for Homodyne and Heterodyne Receiver
Dr. Mahesh Kr Singh and Dr. Dharmendra Kumar Jhariya (ECE)	International Conference on Intelligent Systems and Smart Infrastructure (ICISSI 2022) at SIET Prayagraj (UP) India.	May 21-22, 2022	New framework for Implementation of Decision Tree Classifier
Dr. D. Vaithiyanathan (ECE)	Guest Lecture in Electronics Engineering Association organized by MIT Campus, Anna University, India	June 10, 2022	System on Chip Design
	5-Days FDP Internet of Everything (IoE) organized by Academic Staff College in association with school of Electronics Engineering of VIT Vellore, India	May 20, 2022	AI for Embedded Systems
	AICTE - ISTE Sponsored Induction/ Refresher Proramme organized by RGCET, Puducherry, India	February 09, 2022	VLSI architecture for Medical Image Processing
Dr. Rikmantra Basu (ECE)	Expert Talk at the Mechatronics Department of Chandigarh University	April 22, 2022	Evolution of Electronics and Photonics and it's Challenges
Dr. Sandeep Kumar (ECE)	7th International Conference on Computing in Engineering & Technology (ICCET 2022), DBATU, Raigad	February 12, 2022	EEG based Motor Imagery Classification using CNN
	2nd International conference on smart data intelligence (ICSMDI 2022), KCET, Trichy, India	April 11, 2022	Comparative analysis of fuzzy logic based image enhancement techniques for MRI brain images
	International Conference On Intelligent Systems and Smart Infrastructure (ICISSI-2022) at SIET Prayagraj (UP) India.	May 21-22, 2022	Study and Implementation of efficient Pseudorandom Number Generator
Dr Leeladhar Nagdeve (Mech. Engg.)	One-week AICTE-QIP sponsored STC on "Advances in Manufacturing Engineering and Materials" at Department of Mechanical Engineering, IIT Indore	April 4-9, 2022	Nano-finishing of Bio-Materials using advanced finishing techniques
	One-Day workshop on "Prototype/Process Design & Development Prototyping" Organised by Department of Mechanical Engineering, IIMT College of Engineering, Greater Noida, INDIA	May 4, 2022	Nano-finishing Techniques
	1st International Conference on Sustainable Materials Manufacturing and Energy Technologies (SMMET-2022) organized by Department of Mechanical Engineering, RKGIT Ghaziabad (UP)	June 24-25, 2022	Alternative Fuels for IC engines
Dr. Ashok Dewangan (Mech. Engg.)	1st International Conference on Sustainable Materials Manufacturing and Energy Technologies (SMMET-2022) organized by Department of Mechanical Engineering, RKGIT Ghaziabad (U.P.)	June, 24-25, 2022	**a.** A Review on Thermo-radiative Photovoltaic Cells: Night-time Photovoltaic Cell **b.** Shape Memory Alloy Wheels for Mars Rovers **c.** MMAM of Al/Cu Alloy by SLM Process