IEEE GRSS Bangalore Chapter
in association with
IEEE-IISc student Branch

Distinguished Lecture

Date/Time: 21 Nov 2025 Monday 2.30pm-4pm

Venue: Golden Jubilee Seminar Hall,

ECE Dept, Indian Institute of Science

Speaker: Dr. Vijay Kumar Mishra

Distinguished lecturer of IEEE GRSS, VTS, ComSoc and AESS

Title: Signal Processing for Integrated Sensing and Communications

Abstract: In this talk, we focus on the recent developments toward distributed integrated sensing and communications (ISAC). We consider a broad definition of coexistence, which covers ISAC, collaborative communications, and sensing with interference. Toward fully realizing the coexistence of the two systems, optimization of resources for both new/futuristic sensing and wireless communications modalities is crucial. These synergistic approaches that exploit the interplay between state sensing and communications are both driving factors and opportunities for many current signal processing and information-theoretic techniques. Building on the existing approaches, the lecture focuses on highlighting emerging scenarios in collaborative and distributed ISAC, particularly at mm-Wave and THz frequencies, highly dynamic vehicular/automotive environments that would benefit from information exchange between the two systems. It presents the architectures and possible methodologies for mutually beneficial distributed co-existence and co-design, including sensor fusion and heterogeneously distributed radar and communications.

All are Welcome

Please register using the link: *Register Here*

Profile

Kumar Vijay Mishra (S'08-M'15-SM'18) obtained a Ph.D. in electrical engineering and M.S. in mathematics from The University of Iowa in 2015, and M.S. in electrical engineering from Colorado State University in 2012, while working on NASA's Global Precipitation Mission Ground Validation (GPM-GV) weather radars. He received his B. Tech. *summa cum laude* (Gold Medal, Honors) in electronics and communication engineering from the National Institute of Technology, Hamirpur (NITH), India in 2003. He is a Senior Fellow at the United States DEVCOM Army Research Laboratory; Research Scientist at the Institute for Systems Research, The University of Maryland, College Park under the ARL-ArtIAMAS program; Technical Adviser to Singapore-based automotive radar start-up Hertzwell; and honorary Research Fellow at SnT - Interdisciplinary Centre for Security, Reliability and Trust, University of Luxembourg. Previously, he had research appointments at the Electronics and Radar Development Establishment (LRDE), Defence Research and Development Organisation (DRDO) Bengaluru; IIHR - Hydroscience & Engineering, Iowa City, IA; Mitsubishi Electric Research Labs, Cambridge, MA; Qualcomm, San Jose; and Technion - Israel Institute of Technology.

Dr. Mishra has served as the Distinguished Lecturer (DL) of various societies: IEEE Communications Society (2023-2024), IEEE Aerospace and Electronic Systems Society (AESS) (2023-2024, 2025-2026), IEEE Vehicular Technology Society (2023-2025, 2025-2027), and IEEE Geoscience and Remote Sensing Society (2024-2025). He has been a Virtual DL of IEEE Future Networks Initiative (2022) and Traveling Lecturer of Optica (2025-). He is the recipient of the IEEE Signal Processing Society Pierre-Simon Laplace Early Career Technical Achievement Award (2024), Special Mention for the IEEE AESS M. Barry Carlton Award (2023), IET Premium Best Paper Prize (2021), IEEE T-AES Outstanding Editor (2021, 2023, 2024), U. S. National Academies Harry Diamond Distinguished Fellowship (2018-2021), American Geophysical Union Editors' Citation for Excellence (2019), Royal Meteorological Society Quarterly Journal Editor's Prize (2017), Viterbi Postdoctoral Fellowship (2015, 2016), Lady Davis Postdoctoral Fellowship (2017), DRDO LRDE Scientist of the Year Award (2006), NITH Director's Gold Medal (2003), and NITH Best Student Award (2003). He has received Best Paper Awards at IEEE MLSP 2019 and IEEE ACES Symposium 2019.

Dr. Mishra is Chair (2023-2026) of the International Union of Radio Science (URSI) Commission C, Chair (2025-) of IEEE AESS Technical Working Group on Integrated Sensing and Communications (ISAC-TWG), and Vice-Chair (2021-present) of the IEEE Synthetic Aperture Standards Committee, which is the first SPS standards committee. He has been Chair (2023-2025) of the IEEE SPS Synthetic Apertures Technical Working Group. He has been an elected member of three technical committees of IEEE SPS: SPCOM, SAM, and ASPS, and IEEE AESS Radar Systems Panel. He is Editor-in-Chief of *River Rapids Series in Radar Systems, Signal Processing, Antennas and Electromagnetics* (2025-). He has been Senior Area Editor of *IEEE Transactions on Signal Processing* (2024-), Associate Editor of *IEEE Transactions on Aerospace and Electronic Systems* (2020-) and *IEEE Transactions on Antennas and Propagation* (2023-). He has been a lead/guest editor of several special issues in journals such as *IEEE Signal Processing Magazine*, *IEEE Journal of Selected Topics in Signal Processing*, *IEEE Journal on Selected Areas in Communications*, and *IEEE Journal of Selected Topics in Applied Earth Observations and Remote Sensing*. He is the lead co-editor of several books on signal processing and radar: *Signal Processing for Joint Radar-Communications* (Wiley-IEEE Press, 2024), *Next-Generation Cognitive Radar Systems* (IET Press Electromagnetics and Radar Series, 2023), *Advances in Weather Radar Volumes 1, 2 & 3* (IET Press Electromagnetics and Radar Series, 2023), and *Handbook of Statistics 55: Multidimensional Signal Processing* (Elsevier). His research interests include radar systems, signal processing, remote sensing, and electromagnetics.