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Registration Form for Distinguished Lectures "The Transformative Impact of Machine Learning Enabled Computational Electromagnetics on the Future of Wireless ” By Prof. Konstantinos (Costas) Sarris

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Thanks for filling out **Registration Form for Distinguished Lectures "The Transformative Impact of Machine Learning Enabled Computational Electromagnetics on the Future of Wireless ” By Prof. Konstantinos (Costas) Sarris**

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Registration Form for Distinguished Lectures "The Transformative Impact of Machine Learning Enabled Computational Electromagnetics on the Future of Wireless ” By Prof. Konstantinos (Costas) Sarris

Organized by Department of Electronic Science, University of Delhi South Campus, New Delhi and IEEE APS & CRFID Delhi Section Joint Chapter

Lecture-1: 4PM-5:00PM, IST Date:01/09/2025 (Monday)

"The Transformative Impact of Machine Learning Enabled Computational Electromagnetics on the Future of Wireless"

Abstract: The continuous proliferation of wireless technologies, from 5G communications to the Internet of Things, creates a compelling need to intelligently plan the deployment of such systems in indoor and outdoor environments. This planning is required to meet the desired Quality of Service objectives (e.g. high bit-rates for Wi-Fi networks) along with safety standards for exposure of users to radiated emissions, and to ensure compatibility with existing systems. Wireless propagation modeling, which is the prediction of the electromagnetic field levels generated by a wireless communication system, is an essential element of such an intelligent planning process. These models can be deduced by numerical algorithms based on the physics of electromagnetic wave propagation, or by measurements.
Software-based planning is a reality in several areas, including the design of environmentally friendly buildings, where simulation tools are used to optimize heat and air flow. The question is how to enable a similar approach for wireless infrastructure that is becoming as indispensable as any other infrastructure element.
This presentation is aimed at demonstrating that machine learning enabled propagation models can address this question, overcoming the dichotomy between accuracy and efficiency that has dominated this area for decades. We give an overview of the most recent advances in the field, including neural networks that can accurately predict, in real-time, signal strength levels of indoor and outdoor wireless networks by processing the geometry and the position of one or more transmitters. We discuss the use of such models for the rapid placement of massive numbers of access points of wireless networks, such as those providing wireless connectivity to spectators in large sports venues. Finally, we show that this research leads to reliable “digital twins” of wireless communication systems. These are robust computational models that allow for the full evaluation of the performance of wireless networks, under changes in the environment and the conditions of operation over time.

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Designation *

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- [ ] Industry Personal
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