EMC Professional Talk

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PIML-Driven EMI/EMC Simulations

Electromagnetic Interference and Compatibility (EMI/EMC) are crucial aspects of electrical and electronic devices. There are many standards that strictly regulate the emission levels allowed from any electrical device. EMI simulation tools play an essential role during product design by investigating any unintentional emissions before compliance testing. However, these tools suffer from several problems that make them complicated and not environmentally friendly. For instance: 1) long simulation time, 2) computational complexity, and 3) high energy consumption. All these issues make EMI simulations non-green and costly.

One potential solution to these problems is utilizing Machine Learning (ML) as a green alternative to traditional simulations. The fusion of Physics-Informed Machine Learning (PIML) with conventional ML techniques has emerged as a transformative force, seamlessly integrating domain-specific physics with ML. For example, in an EMC setting, it can encode Maxwell's equations and fundamental principles, bridging theory and data. This proposed approach can reduce dependence on computationally expensive simulations and accelerate EMI modeling without the need for structure discretization as in traditional numerical simulations.

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Zoom:	https://ovgu.zoom.us/j/65212681357?pwd=T085Q3k5MUtUL01yaDhXNXkybkIzUT09
Meeting-ID:	**652 1268 1357**
passcode:	**751648**

About the speaker:

Mohamed Kheir received his MSc degree in Communications Technology from Ulm University in 2005, and the PhD degree (with honors) in Information Engineering and Technology from the German University in Cairo in collaboration with Magdeburg University in 2011. From 2012 till 2015, he was a Lecturer at Kiel University where he was involved in teaching and research. From 2015 to 2020, he was a Senior RF/EMC Expert with IMS Connector Systems Group and Keysight Technologies. Since 2020 till 2023, he has been an EMC Technical Leader at Nokia Networks, Ulm – Germany. Right now, he is an Associate Professor EMC Group Leader at SDU Sønderborg – Denmark.

He also serves as an Associate Editor at IEEE Access and IEEE Internet of Things Journal. He was the recipient of numerous prestigious awards and honors from different conferences and organizations worldwide. His research interests focus on Novel EMI/EMC Simulation Techniques and Smart EMI Shielding Materials.

Organization:

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