SEMINAR ANNOUNCEMENT

DEPARTMENT OF ELECTRICAL AND COMPUTER ENGINEERING
COLLEGE OF DESIGN AND ENGINEERING
Website: https://cde.nus.edu.sg/ece

Area: Power and Energy Systems (PES)

Host: Dr Zhao Zhenyu

Technical Seminar Jointly Organized by ECE/NUS and IEEE Singapore EMC Chapter

TOPIC	:	**Improving the Electromagnetic Compatibility by implementing Advanced Output Driver Design Techniques**
SPEAKER	:	**Prof Bernd Deutschmann, Marco Pfeifer, Ko Odreitz & Michael Kleinschuster** **Graz University of Technology, Graz, Austria**
DATE	:	**Saturday, 09 May 2026**
TIME	:	**10:00AM-12:00PM**
VENUE	:	**E4-05-39 - ECE Conference Room**

ABSTRACT

Modern electronic systems increasingly face severe electromagnetic compatibility (EMC) challenges driven by rapidly growing data rates, fast switching transitions, and higher integration densities. High switching activities of CMOS output drivers represent one of the dominant sources of electromagnetic emissions (EME), making their design a critical factor for ensuring reliable operation in high-speed and safety-relevant applications. The first part of this technical presentation focuses on the aspects advanced output drivers with respect to the generated electromagnetic emissions. An interactive session introduces the theoretical background of emissions generated by switching activity of the CMOS output driver. The underlying sources are explained, and the influence of key design parameters on emission behavior is discussed. A hands-on example demonstrates how electromagnetic emissions can be reduced through the application of various mitigation techniques, such as Edge-Shaping, distributed and weighted slew-rate control and Skewing.
In the second part additionally influencing factors, such as radiation, temperature, radio frequency interference (RFI) further referred as “combined effects” are discussed. Ongoing research activities on combined effects on EME are presented. The influence of radiation effects on EME behaviour will be discussed, as well as the electromagnetic susceptibility of functional safety features under simultaneous stress conditions. In addition, measurement techniques for characterizing electromagnetic emissions will be presented. It will be demonstrated how electromagnetic interference combined with environmental stress factors can lead to malfunctions in functional safety mechanisms.

BIOGRAPHY

Bernd Deutschmann received his M.Sc. degree and the Ph.D. degree in telecommunication engineering from the Graz University of Technology/Austria in 1999 and 2002, respectively. From 2000 to 2006 he worked at austriamicrosystems AG on improving the electromagnetic compatibility (EMC) of integrated circuits. In 2006, he joined the Automotive Power EMC Center of Infineon Technologies AG in Munich/Germany, where he focused his research activities on EMC aware IC design and EMC simulation of ICs for automotive power applications. In 2014, he returned to academia and moved to the Graz University of Technology/Austria as full professor for "Electronics" and head of the Institute of Electronics. His research area is the design of electronic systems and integrated circuits with a special focus on their electromagnetic compatibility. This area includes topics such as electromagnetic emission reduction, transient noise and radio frequency interference immunity enhancement, EMC simulation, EMI propagation in integrated circuits, EMC characterization of integrated circuits, and analog device susceptibility. As part of his research activities, he has filed several patents and authored and co-authored numerous papers and technical articles in the field of electromagnetic compatibility of integrated circuits. Dr. Deutschmann is a member of the international steering committee of EMC Europe and Prime and a member of the international TPC of EMC Compo, as well as chairman of IEEE Austria EMC Society.

A group of PhD students, supervised by Prof. Deutschmann including Michael Kleinschuster, Marco Pfeifer and Ko Odreitz are sharing their research activities on identifying the sources of electromagnetic emissions (EME) and present EME mitigation techniques.