Dr. Todd Hubing

Michelin Professor of Vehicle Electronics, Clemson University

Dr. Todd Hubing is the Michelin Professor of Vehicle Electronics at Clemson University. He holds a BSEE from MIT, an MSEE from Purdue, and a Ph.D. from North Carolina State University. He began his career as an EMC engineer for IBM in 1982, where he did EMC testing and troubleshooting on a variety of computer and network communications products. In 1989, he became a faculty member at the University of Missouri-Rolla (UMR) where he worked with other faculty and students to analyze and develop solutions for a wide range of EMC problems affecting the electronics industry. Since moving to Clemson in 2006, he has continued his work in electromagnetic compatibility and computational electromagnetic modeling, particularly as it is applied to automotive and aerospace electronics. Dr. Hubing is a Fellow of the Institute of Electrical and Electronics Engineers (IEEE) and a Fellow of the Applied Computational Electromagnetics Society.

Dr. Tom Jerse

Associate Professor Citadel Dept. of Electrical and Computer Engineering

Tom Jerse has over 30 years experience with Hewlett-Packard and Boeing in solving EMI problems both at the circuit and systems level, and has earned a PhD in EMC from the University of Kentucky. He presently holds the dual positions of Professor of Electrical Engineering at The Citadel and Associate Technical Fellow of the Boeing Company. He served two years as a distinguished lecturer of the EMC Society, and has developed and taught original EMC courses at the professional and university level since 1981.

19620 Hale Ave
Morgan Hill, CA 95037

[CUSTOMER NAME]
[STREET ADDRESS]
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SCV EMC 2010 Mini Symposium September 23-24

featuring

Dr. Todd Hubing

and

Dr. Tom Jerse

IEEE EMC SOCIETY

Santa Clara Valley

Doubletree Hotel San Jose
2050 Gateway Place
San Jose, CA 95110
Web site: www.scvemc.org

Day One: September 23

EMC Modeling and Design
by
Dr. Todd Hubing

Registration & Continental Breakfast: 7:00 AM

Morning Session: 8:00 AM – 12:00 PM

Power Inverter / Motor Design for Reduced Emissions

Power inverters are found in a wide range of electronic products ranging from cell phones to hybrid electric vehicles. The fast high-current switching in these inverters can be the source of significant electromagnetic interference if sufficient care is not taken to ensure that the fields and currents associated with this switching are well contained. This presentation reviews basic inverter design principles and describes design methodologies to minimize electromagnetic emissions.

Grounding and Shielding in Mixed Signal PCBs

Printed circuit boards with both digital and analog circuits are very common in today's highly integrated systems. Interference between the digital and analog portions of a board can be a significant problem if sufficient care is not taken to minimize unwanted coupling between circuits operating at voltages and currents differing by orders of magnitude. This presentation describes basic strategies for designing mixed-signal printed circuit boards that meet electromagnetic compatibility requirements without extensive shielding and filtering.

Lunch: 12:00 PM – 1:30 PM

Afternoon Session: 1:30 PM – 5:00 PM

Component Characterization for System-Level Modeling

The biggest challenge facing engineers who want to model complex electronic systems using electromagnetic modeling tools is usually not a lack of adequate tools or computing resources. More often, the biggest challenge is obtaining reliable models for the components (integrated circuits, boards or sub-systems) that are the ultimate sources or victims of the interference. Current EMC test standards such as IEC-61976 (for ICs) and CISPR-25 (for automotive components) evaluate system components by placing them in a standardized test configuration and measuring the performance of the standardized system. Unfortunately, correlation between the performance of the standardized system and the performance of the component in real products is generally poor. This presentation describes methods for characterizing components as EM sources in complex system models.

How Productive EMC Engineers use Computer Modeling Tools

Electromagnetic modeling software has become an essential tool for antenna, signal integrity and microwave circuit engineers, but electromagnetic compatibility (EMC) engineers do not widely rely on them. EMC Engineers are primarily interested the unforeseen consequences of interactions between circuits and systems. These interactions often depend on undocumented parameters or parameters that the system designer does not control (e.g. the position of attached cables or out-of-band component parameters). Unlike an antenna or a microwave circuit, the electromagnetic behavior of most digital electronics cannot be rigorously modeled or controlled. Nevertheless, computer modeling tools **are** being used to help EMC engineers design better products. This presentation reviews the ways that these tools are being used today and discusses the impact that computer modeling is likely to have on the EMC design of electronic systems in the future.

Day Two: September 24

Radiated Immunity and Cosite Interference
by
Dr. Tom Jerse

Continental Breakfast: 7:00 AM

Morning Session: 8:00 AM – 12:00 PM

Part I: Radiated Immunity

As the density of the electromagnetic environment continues to increase, the ability of electronic devices to withstand external EM fields becomes more vital. In addition to applicable military and IEC regulations, for manufacturers radiated immunity is a product reliability and customer satisfaction issue. This presentation will address the radiated susceptibility and current injection tests used to assess the immunity of a device, and then detail EMC design principles for its desensitization.

Part II : Cosite Interference

The economics of the rising demand for the wireless transmission of information has made it increasingly attractive to place a large number of emitters and receivers on a single tower or vehicle. Suppressing interference between all possible combinations of these radios has stretched the limits of EMI control, and has made careful system modeling and planning more vital than ever. This presentation will outline mechanisms and models used to predict the close range EMI between systems located on the same platform. Various alternatives for interference mitigation will be discussed.

Reception: 5:00 PM - 6:00 PM on September 23

NOTE: There will be a 30 minute mid-morning and mid-afternoon break scheduled each day.

NOTE: The registration fee includes one copy of the technical program, continental breakfast, lunch, refreshment breaks, and the reception at the conclusion of the first day of the event. The organizing committee reserves the right to substitute speakers, restrict size, or to cancel the event and exhibition. In the event the organizing committee cancels this event, registration fees will be fully refunded. Individuals canceling their registration prior to September 9 will receive a full refund. No refunds will be made to individuals who cancel their registration after September 9. Substitutions are allowed. Attendance is limited. Registration will be confirmed on a first come, first served basis.

Registration Form

Registration Rates:	*Before 8/23*	*8/23-9/23*
❒ IEEE Member	$375	$450
❒ Non-Member	$425	$500
❒ Student/Un-Employed*	$150	$225

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$400 for group registration rate (5 or more)

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IEEE SCV EMC SOCIETY
Attn: Len Goldschmidt, Secretary
170 West Tasman Drive
San Jose, CA 95134-1706
E-mail: lgoldsch@cisco.com

Janet O'Neil, Exhibits Chair
Email: Janet.O'Neil@ETS-Lindgren.com