

September 2018

Event

Rock River Valley Section

www.ieee.org/rrvs

Sense

The Institute of Electrical and Electronic Engineers, Inc.

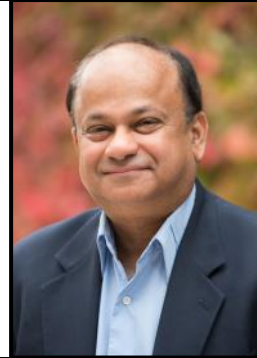
IEEE RRV Section, Power Electronics Chapter Meeting

SERVING IEEE MEMBERS OF NORTH CENTRAL ILLINOIS AND SOUTH CENTRAL WISCONSIN

WHEN Thursday, September 27, 2018

WHERE

Rock Valley College
Woodward Technology Center
Room: WTC1322
3301 North Mulford Road
Rockford, IL 61114



AGENDA

6:00 PM Networking
6:30 PM Dinner
7:15 PM Presentation

Reliability of High-Density Power Electronics Switching Converters

Krishna Shenai

Senior Fellow at the Computation Institute, University of Chicago and
Adjunct Professor of Electrical Engineering and Computer Science at Northwestern University

High-density power conversion using highly efficient wide bandgap (WBG) power devices based on advanced systems integration is gaining increased attention world-wide in aerospace, electric vehicles and distributed power systems. The overall systems reliability is a prime concern that is among the least understood topics today in miniaturized power systems. It is well-known that power electronics switching devices experience extreme electrical and thermal stresses in an application circuit. The problem is further compounded by the fact that today's design methodologies of power electronics switching converters do not account for performance degradation of circuit components and thermal management system with aging. As a result, design of a power converter with a prescribed mean-time-between-failure (MTBF) is not possible. This talk will discuss the current state-of-the-art in this critical area and propose improvements needed for the development of high-density power converters employing advanced silicon and wide bandgap (WBG) semiconductor power switching devices.

Krishna Shenai is a Senior Fellow at the Computation Institute, University of Chicago, Chicago, Illinois (USA) and an Adjunct Professor of electrical engineering and computer science at Northwestern University, Evanston, Illinois (USA). He earned his PhD degree in electrical engineering from Stanford University, Stanford, CA in 1986. For nearly 40 years, Dr. Shenai has pioneered and made seminal contributions to the development and manufacturing of power semiconductor materials and devices, and power converters and power amplifiers. He is a Fellow of IEEE, a Fellow of APS, a Fellow of AAAS, a Fellow of IETE-India, and a member of the Serbian Academy of Engineering. Dr. Shenai has authored or co-authored more than 450 peer reviewed archival papers and 10 book chapters; edited twelve conference digests; authored three books; and, is a named inventor in 13 issued US patents. He was the Editor of IEEE Trans. Electron Devices (1990-2000), founding Editor-in-Chief (EIC) of IEEE Electron Devices Society Newsletter (1994-2002), and served as the invited guest editor for two Special Issues of IEEE Trans. Electron Devices and two Special Issues of IEEE J. Solid-State Circuits. Currently, he serves as an editor of IEEE J. Electron Devices Society (JEDS) and as Distinguished Lecturer of both IEEE Electron Devices Society (EDS) and IEEE Power Electronics Society (PELS).

MEAL INFORMATION

Dinner entrée will feature your choice of
Vegetarian or Non-Vegetarian meals.

Members & Student Members: FREE,
Non-members: \$10,
Student non-members: \$5
Presentation only: FREE

Please register online at

<https://events.vtools.ieee.org/m/177460>

or by emailing Diane Sennebogen at diane.brock@utas.utc.com by Thursday, Sept 27 at 1 pm. Please include the following: name, phone number, email address, and IEEE member number. The meeting is open to the general public.

IEEE RRV Section, EMC and IAS Section Meeting
SERVING IEEE MEMBERS OF NORTH CENTRAL ILLINOIS AND SOUTH CENTRAL WISCONSIN

WHEN Thursday, October 25, 2018

WHERE

NTS

3761 S. Central Ave.
 Rockford, IL 61102

AGENDA

5:30 PM Tour of NTS
 6:30 PM Dinner
 7:15 PM Presentation



Radiated Emissions: Understanding Product and Measurement Antenna Behavior

Colin E. Brench

Principal Engineer at Amphenol High Speed Interconnects

Antenna behavior is complex in an environment that does not approach that of free space, and is particularly so if the antenna is incidental to a device or system. There are numerous, unintended antennas that are present in every electronic device. With the high data rates in use today, even small structures can be effective, unwanted antennas. The impact of how a device is mounted into a chassis or how a chassis is mounted into a rack can be unexpected. Every conductor with a radio frequency current on it is an antenna to some degree, and understanding how these unintended antennas are created and driven is a powerful tool in controlling radiated emissions.

This presentation will first explore the behavior of both measurement antennas and unintended antennas. Secondly, various sized systems will be discussed, from the very small devices up through full sized racks of systems. Finally, animations of field propagation will be used to help visualize how the RF energy travels and is radiated. Important details such as the addition of a ferrite core filter on a cable and cable shield bonding will also be shown.

This meeting will also feature a tour of NTS Rockford's testing facility.

Colin E. Brench (M'80-SM'04) is currently a Principal Engineer at Amphenol High Speed Interconnects, in Nashua, New Hampshire, where he is responsible for the EMC aspects of high data rate (10 to 56 Gbps) interconnect schemes. He received his B.Sc. (Hons) in Electronic Engineering at The City University, London, in 1975, and has been particularly active in the areas of EMC, antennas, and shielding behavior since the early 1970's. Colin has presented numerous EMC workshops and training classes that embrace a broad range of topics including microprocessor packaging, printed circuit module issues, system design, and shielding. He is a co-author of the book, EMI/EMC Computational Modeling Handbook (Springer, 2nd Edition 2001), has authored over 20 technical papers and articles, and holds 12 patents for various methods of EMI control.

Colin is a Senior Member of the IEEE, member of the EMC Society since 1980, and an iNARTE certified EMC Master Design Engineer. He was appointed a Distinguished Lecturer for the IEEE EMC Society for 2001 and 2002, and has given several seminars for various IEEE chapters and sections. In 2002 he was awarded the Certificate of Technical Achievement by the IEEE EMC Society for his contributions to the development of EMC modeling directed to understanding EMI shielding and antenna behavior. Colin has also been active in IEEE EMC-S standards, IEEE EMC-S Technical Committee 9 (TC-9), ANSI ASC63, and served 11 years on the IEEE EMC-S Board of Directors. Colin received the EMC Society Honored Member Award in May 2018, recognizing a lifetime of dedicated service to the Society.

MEAL INFORMATION

Dinner entrée will feature your choice of Vegetarian or Non-Vegetarian meals.

Members & Student Members: FREE,
 Non-members: \$10,
 Student non-members: \$5
 Presentation only: FREE

Please register online at

<https://events.vtools.ieee.org/m/177461>

or by emailing Diane Sennebogen at diane.brock@utas.utc.com by Thursday, Oct 25 at 1 pm. Please include the following: name, phone number, email address, and IEEE member number. The meeting is open to the general public.

IEEE Rock River Valley Section 2018 Calendar of Events

January 22: IEEE Chicago/Rockford Consultants' Network Meeting

January 25: RRVVS Section Meeting

February 22: RRVVS Section Meeting, Engineer's Week

February 24: [Discover Engineering at Discovery Center Museum](#)

March 29: RRVVS Section Meeting

April 20 NIU Student Branch Networking Social at Northern Illinois University

April 26: RRVVS Section Meeting,

May 31: RRVVS Section Meeting with Chicago-Rockford Consultants' Network

June 12: EMC Seminar.

June 28: RRVVS Section Meeting, Annual Picnic and Officer Elections at Hamilton Sundstrand Park

August 30: RRVVS Section Meeting

September 27: RRVVS Section Meeting

October 25: RRVVS Section Meeting

November 15: RRVVS Section Meeting at NIU

Stay Connected, Join us on Social Media

Facebook: <https://www.facebook.com/ieeerrvs/>

LinkedIn: <https://www.linkedin.com/groups/12087034>

IEEE Collabratec: <https://ieee-collabratec.ieee.org/>

Missed a meeting? Check out our Google Drive for previous presentations.

IEEE RRVVS Google Drive: <https://drive.google.com/a/ieee.org/>

1. Login with IEEE account
 2. On the left menu, click "Shared with me".
 3. Click on "Members Folder"
 4. Browse folders for past meeting presentations
-
-

2018 IEEE RRVS Executive Committee



Rakesh Vasudevan
Chair
rakeshv@ieee.org
815-226-4299



Terry Johnson
Vice Chair
Terry.Johnson@utas.utc.com
815-394-2447



Patrick Conner
Secretary



Adrian Vandergrift
Treasurer
aevandergrift@ieee.org
815-226-2518



Andrew Baker
Communications Chair
abaker@ieee.org



Jitendra Solanki
PACE & MD Chair
J.solanki@ieee.org
815-394-5675



Joe Etminan
IAS Chapter Chair
joeetminan@ieee.org
815-558-0007



Mark Harris
PELS Chapter Chair
m.harris@ieee.org
815-226-6098



Alkesh Patel
Computer & Controls
Chapter Chair
Alkesh.patel@ieee.org



Jamal Shafii
Co-EMI Chapter Chair
jamalshafii@ieee.org
815-394-5676



Steve Davidson
EMI Chapter Chair
steve.davidson@ieee.org



Larry Wachowiak
Life Members Chair
L.wachowiak@ieee.org



Marjan Shirani
WIE Chair
Marjan.shirani@hs.utc.com
815-394-2420



Prof. Don Zinger
NIU St Br Counselor
Educational Act. Chair
d.zinger@ieee.org
815-753-0540



Eduardo Vasquez
Young Professionals
Chair
evasquez@ieee.org



Bob Parro
Section Advisor
B.parro@ieee.org



Gary Blank
Section Advisor
G.L.Blank@ieee.org

Northern Illinois University IEEE Student Branch Officers



**Fahad
Mohammedhussein**
Chair



Salman Alzobidy
Vice Chair

**Mohammed
Maaz Ali**
Treasurer

Caleb Owen
Secretary



Mary Reinertson
President

Katie Berendt
Vice President &
Treasurer

Haley Tribo
Corresponding &
Recording Secre-



**IEEE Personal E-Mail Alias Service
with Free Virus Scanning**

The IEEE now offers an **Alias Service** in which all IEEE **members** can register a **personal alias** of their choice, which will forward E-Mail to their real internet e-mail address. Visit...

https://www.ieee.org/membership_services/membership/googleapps.html

Update Your IEEE Member Contact Info Online

<http://www.ieee.org/web/membership/home/index.html>

[Electronic IEEE Membership Application](#)

RRVS Calendar

Visit our website for the full 2018 meeting schedule

<http://sites.ieee.org/rockrivervalley/>

Join us on Facebook:

<https://www.facebook.com/ieeerrvs/>

Join us on LinkedIn:

<https://www.linkedin.com/groups/12087034>

IEEE Collabratec:

<https://ieee-collabratec.ieee.org/>

Rock River Valley Section Chapters

Industry Applications Society Chapter
Established 1992

Joint Computer/Control Systems Society Chapter
Established 1995

Power Electronics Society Chapter
Established 1996

Electromagnetic Compatibility Society Chapter
Established 2007

The Rock River Valley Section gratefully acknowledges the following companies and colleges for supporting Section Officers:

[UTC Aerospace Systems](#) • [Northern Illinois University](#) •
[Rock Valley College](#) • [River North Solutions](#)