FREEDM SYSTEMS CENTER

Annual Research Symposium
April 10-12, 2019
Duke Energy Hall, Hunt Library

Speaker Bios

Sandeep Bala, ABB
Research Team Manager, Corporate Research

At ABB Dr. Bala is responsible for research on low and medium voltage power electronics technologies specifically volt-VAR control devices for the distribution grid, distributed energy storage units, and grid integration of offshore wind and marine renewable energy. His team currently works on using wide bandgap devices in power converters for PV inverters, UPS systems, EV chargers, and motor drives. Prior to joining ABB in December 2008, he obtained his M.S. and Ph.D. degrees in Electrical Engineering from the University of Wisconsin-Madison.. He received his Bachelor's degree in Electrical Engineering from the Indian Institute of Technology Bombay.

B. Jayant Baliga, NC State University
Progress Energy Distinguished University Professor

Jay Baliga was inducted into the National Inventors Hall of Fame as the sole inventor of the Insulated Gate Bipolar Transistor (IGBT) in 2016. He has authored 23 books, over 600 publications, and holds 120 U.S. Patents. Dr. Baliga received the National Medal of Technology and Innovation from President Obama in 2011 and the North Carolina Award for Science from Governor Purdue in 2012. He received the IEEE Medal of Honor in 2014.
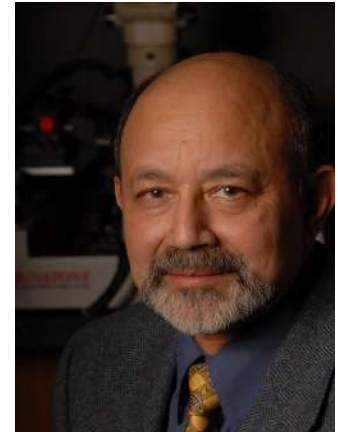
Anup Bhalla, United Silicon Carbide
Vice President of Engineering

Dr. Anup Bhalla received his Ph.D. from the Rensselaer Polytechnic Institute in 1995 in Electrical Engineering. He is the primary or co-inventor on over 100 patents covering semiconductor device structures, processing and packaging techniques in the area of power semiconductors. At United Silicon Carbide, Dr. Bhalla oversees the development of Silicon Carbide Discrete Devices, Power Modules and SiC Integrated Circuits. Before joining United Silicon Carbide in 2012, Dr. Bhalla was Vice President of the High Voltage MOSFET product line at Alpha & Omega Semiconductor, a company that he co-founded in 2000, now valued over $400M.

Subhashish Bhattacharya, NC State University
Duke Energy Distinguished Professor, ECE

Dr. Bhattacharya's research interests include Solid State Transformers, medium voltage power converters enabled by high voltage SiC devices, Flexible AC Transmission Systems, high frequency magnetics, and power conversion systems for renewable energy sources. Previous employers include Westinghouse/Siemens and ABB. Some notable projects include work on the New York Power Authority Convertible Static Compensator of 2 x 100MVA VSC for 345kV transmission system. His PhD research on active power filters at the University of Wisconsin Madison was commercialized by York Corporation. Subhashish has over 500 publications, 5 patents, and multiple pending patent applications.

Steven Boyd, US Department of Energy, Vehicle Technologies Office
Batteries and Electrification Program Manager

Steven Boyd has worked at the US Department of Energy since 2006. In his current position, he oversees research and development projects in hybrid and electric vehicle systems, focusing on electric drive system technologies. Steven received his Bachelor of Science and Master of Science degrees in Mechanical Engineering from Virginia Tech, and participated in DOE's Advanced Technology Vehicle Competitions while a student.

Debrup Das, ABB
R&D Manager, Corporate Research Center

Debrup's areas of expertise include power electronic converters and protection, FACTS systems, and renewable integration. Over the years he has helped bring multiple power electronics based products to market, both in ABB as well as in a California based startup. Debrup holds more than 10 patents and has authored more than 20 peer reviewed papers. He holds Ph.D. and M.S. degrees from Georgia Tech and a Bachelor's degree from IIT Kharagpur, India.

Arnie de Castro, SAS
Principal Product Manager, Industry

Dr. de Castro is responsible for the SAS Energy Forecasting solution, and has developed algorithms for analytics applications in electric utilities. He has over 35 years of experience in building commercial software and in teaching, research, and consulting in the electric utility industry. Prior to working with SAS, he managed the development of software applications for electrical power system optimization, electrical price forecasting and energy transaction risk analysis. Arnie received a Ph.D. in Electrical Engineering from Virginia Tech and is an adjunct faculty member at NC State and UNC Charlotte.

Abishek Dubey, Vanderbilt University
Assistant Professor, Electrical and Computer Engineering

Dr. Dubey is co-lead for the Vanderbilt Initiative for Smart Cities Operations and Research (VISOR) as well as Senior Research Scientist at the Institute for Software-Integrated Systems. His research interest is secure and resilient operation of cyber-physical systems with an emphasis on transportation and power networks. He is a senior member of IEEE and has published over 100 peer-reviewed articles. Previously, Abishek developed techniques for diagnosing cyber-and physical faults in breaker assemblies in transmission lines and developed a privacy-preserving proof of concept-distributed system for peer-to-peer energy exchange. He earned his M.S. (2005) and Ph.D. (2009) in Electrical Engineering from Vanderbilt University and completed his undergraduate studies at the Indian Institute of Technology, Banaras Hindu University, India in May 2001.

John Enslin, Clemson University
Professor, Electrical and Computer Engineering and Duke Energy SmartGrid Technology Chair

Professor Johan Enslin is a Fellow of the IEEE and SAIEE and Registered Professional Engineer in South Africa. His research interests include the role and optimization of energy storage technologies for Virtual Power Plants (VPPs), large-scale renewable energy integration, control center optimization, and high power electronic converter systems. He previously served as the first Director for the Energy Production and Infrastructure Center at UNC Charlotte. Johan has balanced industry and academic leadership over a 37-year career in the US, Europe and South Africa. Some of his industry appointments include CTO at Petra Solar, VP at Quanta Technologies, and VP at KEMA.

Sonja Glavaski, The Faraday Grid
Executive Vice President of Innovation

Dr. Glavaski leads R&D efforts in the United States for The Faraday Grid, a UK-based company developing a new grid system architecture with plug and play devices that dynamically balance and smooth power flow. Previously she served as a Program Director at the Advanced Research Projects Agency-Energy (ARPA-E) overseeing a diverse project portfolio developing innovative and disruptive technologies that facilitate more efficient power generation, electrification of transportation, and enable the grid to be more flexible and resilient. Dr. Glavaski also served as a Control Systems Group Leader at United Technologies Research Center (UTRC) and led key programs at the Eaton Innovation Center and Honeywell Labs. She received her Ph.D. and MS in Electrical Engineering from California Institute of Technology, and Dipl. Ing and MS in Electrical Engineering from the University of Belgrade.

Shuli Goodman, LF Energy
Founder and Executive Director

LF Energy is a Linux Foundation project that supports open source innovation in the energy and electricity sectors in order to accelerate the energy transition and the decarbonization of the world's economies. Dr. Goodman has nearly three decades experience in the startup and ongoing support of governance and multi-stakeholder engagement bodies. Having spent the early part of her career enabling some of the world's largest companies in the world to become Internet ready, Shuli now brings her digital-first, cross-industry background to the electricity sector. Her goal is to inspire, train, and enable 10,000 developers in the next 10 years to digitally transform the world's power systems.

Mike Harris, Atom Power
Vice President of Engineering

In his role as VP of Engineering, Mike oversees research and product development for the company's Solid State Circuit Breakers. Prior to joining Atom Power, Mike was with the lighting division of Cree where he held various leadership roles over his ten year tenure. Prior to Cree, Mike worked at Lockheed Martin, Cisco Systems and LED Lighting Fixtures which was acquired by Cree. He has 30+ years of experience in diverse industries including telecommunications, electric vehicle charging, industrial power systems, lighting and IoT. Mike holds 22 patents in the area of lighting, controls and power systems and earned a Bachelor of Science degree in Electrical and Computer Engineering from Clarkson University.

Andy Haun, Schneider Electric
SVP and CTO for Microgrids Business

As Microgrid CTO, Andy Haun engages the breadth of Schneider Electric and partner offers to simplify the deployment of grid edge energy systems that not only helps to secure electricity delivery, but does so in a way that leverages cleaner, more sustainable energy production. During his 30+ year tenure with Schneider Electric, Andy has led many key product development and technical innovations and is a named inventor on 21 patents relating to circuit protection, relaying and power control. Andy received his Bachelor's Degree in Electrical Engineering from the University of Iowa and has an MBA from Duke University.

Doug Hopkins, NC State University
Research Professor, Electrical and Computer Engineering

Dr. Hopkins is Director of the Laboratory for Packaging Research in Electronic Energy Systems (PREES). He has over 20 years of academic and industrial experience focused on high frequency, high density power electronics with an emphasis on packaging. He received his Ph.D. in Electrical Engineering from Virginia Tech, and spent his early career at the R&D centers of GE and Carrier Air-Conditioning Companies in advanced power electronics systems for military and commercial applications.

Marija Ilic, Massachusetts Institute of Technology
Senior Research Scientist, Laboratory for Information and Decision Systems

Dr. Ilic is a world leader in electric power systems with hundreds of journal and conference publications. Her research interests span detailed dynamical models of the physical aspects of power systems to high-level issues involving coordination and economics. Her more recent research involves defining the next generation of SCADA systems for power networks that take advantage of new capabilities in sensing and communications. Her previous positions include faculty member at Drexel University, Cornell University, University of Illinois, MIT, and Carnegie Mellon University. She is an IEEE Life Fellow and former NSF Program Director in Power Systems. Marija received her doctorate in Systems Science and Mathematics from Washington University in 1980.

Ning Lu, NC State University
Research Professor, Electrical and Computer Engineering

Dr. Ning Lu is an associate professor in Electrical and Computer Engineering Department at NC State University. She received her Ph.D. degree in Electric Power Engineering at Rensselaer Polytechnic Institute, Troy, New York in 2002. Dr. Lu was with Pacific Northwest National Laboratory from 2003-2012. Dr. Lu is a senior member of the IEEE and she has over 100 publications in areas of renewable integration, centralized and distributed load control for providing grid services, smart meter data analytics, and microgrid control and modeling.

Brian Johnson, University of Washington
Assistant Professor

Brian obtained the M.S. (2010) and Ph.D. (2013) degrees in Electrical and Computer Engineering from the University of Illinois at Urbana-Champaign. He is the Washington Research Foundation Innovation Assistant Professor within the Department of Electrical and Computer Engineering at the University of Washington. Prior to joining UW in 2018, he was with the National Renewable Energy Laboratory. He was awarded a National Science Foundation Graduate Research Fellowship in 2010, and currently serves as an Associate Editor for the IEEE Transactions on Energy Conversion. His research interests are in renewable energy systems, power electronics, and control systems.

Gabor Karsai, Vanderbilt University
Professor of Electrical Engineering and Computer Science

In addition to his faculty role, Dr. Karsai is also Senior Research Scientist and Associate Director at the Institute for Software-Integrated Systems at Vanderbilt. He has over thirty years of experience in research on systems and software engineering. His current focus is using model-based design and implementation of cyber-physical systems, programming tools for visual programming environments, and the theory and practice of model-integrated computing. He received his BSc, MSc, and Dr Techn degrees from the Technical University of Budapest, in 1982, 1984 and 1988, respectively, and his Ph.D. from Vanderbilt University in 1988.

Mike Mazzola, UNC Charlotte
Duke Energy Distinguished Professor and Director at EPIC

Dr. Mazzola holds a Ph.D. in EE from Old Dominion University. After three years in government service at the Naval Surface Warfare Center in Dahlgren, Virginia, he joined the faculty at Mississippi State University (MSU) where his research included silicon carbide power semiconductor device prototyping and semiconductor materials growth and characterization. For the past 10 years, he was Associate Director at the MSU Center for Advanced Vehicular Systems where he led research in high voltage engineering, power systems modeling and simulation, and control of hybrid electric vehicle power trains. In addition, he served two years as the CTO of SemiSouth Laboratories, a company he co-founded.

Patrick McGinnis, Naval Surface Warfare Center
Machinery Systems R&D Program Manager

Patrick is a professional engineer and attorney who works with the Office of Naval Research on solid state circuit protection. His industry background includes experience in a variety of technical and corporate management positions with major aerospace and defense organizations. His 15 years of government work experience has focused on the development and application of power semiconductors and electronics in the areas of distribution and conversion for Navy power systems. He holds a Bachelors in Mechanical Engineering from Drexel University, a Juris Doctor of Law from Temple University, and a Masters in IT and Program Management from the University of Maryland.

Trent Miller, Duke Energy   **Brian Dale, Duke Energy**

Trent and Brian are currently members of the Distributed Generation Group within Duke Energy. Trent is a registered Professional Engineer in the state of North Carolina. Brian recently passed the PE exam and continues to pursue his license in North Carolina. Trent holds a B.S. in Electrical Engineering and a B.S. in Computer Engineering from NC State. Brian holds a B.S. in Facilities Engineering from Massachusetts Maritime Academy. Before joining Duke Energy, Trent and Brian both spent over 4 years with Pike Engineering performing voltage/thermal, and protection studies for distribution interconnections on behalf of Duke Energy.

Don Morrow, Navigant
Managing Director, Transmission Operations and Planning

Don has over 36 years of experience in utility system operations and planning. He advises clients in transmission business models and strategy, organizational design, technology implementation, system operations, system planning, and NERC compliance. He also evaluates transmission development opportunities enabled by FERC Order 1000. Prior to joining Navigant, Don spent 26 years working for utilities in system operations and planning most notably as the first Director of System Operations for American Transmission Company.

Jum Musilek, North Carolina's Electric Cooperatives
Director of Innovation and Business Development

North Carolina's Electric Cooperatives is a Raleigh based organization that supplies power and transmission services to 25 member cooperatives throughout the state. Jim's role is to research, test and develop innovative technologies and business models that enable their members to respond to the changing energy landscape. Jim previously led grid modernization efforts that included microgrid development and implementation, community solar, battery storage, and advanced demand response. He has over 25 years of electric utility experience in engineering, operations, planning, rates and portfolio management. He received his B.A. from California State University at Northridge and received his MBA from Campbell University.

Reynaldo Nuqui, ABB
Senior Principal Scientist

Reynaldo Nuqui received his PhD in Electrical Engineering from Virginia Tech with a concentration in measurement, protection, and control of AC and DC power systems. He is the principal investigator of several DOE funded projects on cyber security of energy delivery systems. Dr. Nuqui is with ABB US Corporate Research in Raleigh, NC.

Spyridon Pavlidis, NC State University
Assistant Professor, Electrical and Computer Engineering

Dr. Pavlidis's research interests lie at the intersection of electronic materials, devices, packaging and circuits. He is the Principal Investigator for the Laboratory for Electronics in Advanced Devices and Systems (NCSU LEADS), which is currently developing next-generation power and microwave technologies using wide bandgap III-N semiconductors. Dr. Pavlidis received his M.Eng from Imperial College London (2010), and his Ph.D. degree from the Georgia Institute of Technology (2016). He is a recipient of the ORISE/AFRL Ph.D. Fellowship, the European Microwave Conference Young Engineer Prize, and the National Science Foundation EAPSI Fellowship.

Wenyuan Tang, NC State University
Assistant Professor, Electrical and Computer Engineering

Dr. Tang received the B.Eng. degree in electrical engineering from Tsinghua University in 2008. He received the M.S. degree in electrical engineering, the M.A. degree in applied mathematics, and the Ph.D. degree in electrical engineering from the University of Southern California in 2010, 2014, and 2015, respectively. Prior to joining the NC State faculty in 2017, he was a postdoctoral scholar at the University of California, Berkeley and Stanford University. His research interests include power system operation, energy economics, and data analytics for smart grids.
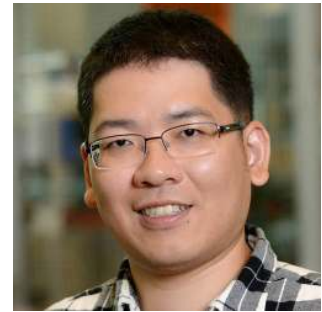
Victor Veliadis, PowerAmerica
Deputy Executive Director and CTO

PowerAmerica is a U.S DOE Manufacturing Institute whose mission is to enable US leadership in wide bandgap power electronics manufacturing, workforce development, job creation, and energy savings. Dr. Veliadis is an IEEE Fellow, an IEEE EDS Distinguished Lecturer, and Professor in ECE at NC State. He received the five-year diploma (1990) from the National Technical University of Athens Greece and the Masters (1992) and Ph.D. (1995) degrees from Johns Hopkins University. Dr. Veliadis spent 21 years in industry where his technical work included design, fabrication, and testing of 1-12 kV SiC SITs, JFETs, MOSFETs, Thyristors, and JBS and PiN diodes.

Hong Wang, Oak Ridge National Lab
Distinguished Scientist

Dr. Wang's research includes fault detection and diagnosis, nonlinear control, and data-based modeling for complex systems. He originated the work on stochastic distribution control which allows modification of an output probability density function for general non-Gaussian dynamic systems. Hong received his Ph.D. from the Huazhong University of Science and Technology in Wuhan, China. He has authored over 300 papers and six books and currently serves as an Associate Editor of the IEEE Transactions on Control Systems Technology and the IEEE Transactions on Automation Science and Engineering. Before joining ORNL in 2019, he worked at the University of Manchester (UK) and Pacific Northwest National Lab.