

# National Science Foundation 2013 National Workshop on Energy Cyber-Physical Systems

## Speakers' Biographies



### Lead Speaker and Workshop Chair

**Mladen Kezunovic** received the Dipl. Ing , M.S. and Ph.D. degrees in electrical engineering in 1974, 1977 and 1980, respectively. Currently, he is the Eugene E. Webb Professor, Director of the Smart Grid Center, Site Director of NSF I/UCRC "Power Engineering Research Center, PSerc", and Deputy Director of another NSF I/UCRC "Electrical Vehicles: Transportation and Electricity Convergence, EV-TEC". His main research interests are digital simulators and simulation methods for relay testing, as well as application of intelligent methods to power system monitoring, control, and protection. He has published over 450 papers, given over 100 seminars, invited lectures and short courses, completed over 100 research projects, and consulted for over 50 companies worldwide. He is the Principal of XpertPower™ Associates, a consulting firm specializing in power systems data analytics. Dr. Kezunovic is a Fellow of the IEEE, a member of CIGRE and Registered Professional Engineer in Texas.

## Invited Speakers



**Anuradha Annaswamy** received the Ph.D. degree in Electrical Engineering from Yale University in 1985. She has been a member of the faculty at Yale, Boston University, and MIT where currently she is the director of the Active-Adaptive Control Laboratory and a Senior Research Scientist in the Department of Mechanical Engineering. Her research interests pertain to adaptive control theory and applications to aerospace and automotive control, active control of noise in thermo-fluid systems, control of autonomous systems, decision and control in smart grids, and co-design of control and distributed embedded systems. She is the co-editor of the IEEE CSS report on Impact of Control Technology: Overview, Success Stories, and Research Challenges, 2011, and the publication "IEEE Vision for Smart Grid Control: 2030 and Beyond," 2013. Dr. Annaswamy has received several awards including the George Axelby and Control Systems Magazine best paper awards from the IEEE Control Systems Society, the Presidential Young Investigator award from the National Science Foundation, the Hans Fisher Senior Fellowship from the Institute for Advanced Study at the Technische Universität München in 2008, and the Donald Groen Julius Prize for 2008 from the Institute of Mechanical Engineers. Dr. Annaswamy is a Fellow of the IEEE and a member of AIAA.



**Philip Brisk** is an Assistant Professor in the Department of Computer Science and Engineering in the Bourns College of Engineering at the University of California, Riverside. His research interests comprise a variety of topics in embedded system design, especially at the intersection of processor architecture, compilers, VLSI/CAD, computer arithmetic, and reconfigurable computing. Philip joined the faculty at Riverside after being a postdoctoral scholar for three years in the Processor Architecture Laboratory in the School of Computer and Communication Sciences at the Ecole Polytechnique Fédérale de Lausanne (EPFL) in Switzerland. He received the B.S., M.S., and Ph.D. degrees, all in Computer Science, from UCLA in 2002, 2003, and 2006 respectively. He is a member of the ACM and the IEEE.



**Ian Dobson** is the Sandbulte Professor of Electrical and Computer Engineering Department Iowa State University. He received his PhD in Electrical Engineering in 1989 from Cornell University in Ithica, NY and a Bachelor of Arts in Mathematics in 1979 from Cambridge University in England. His core research areas include, cascading failure and risk analysis, blackouts, phasor measurements, power grid stability, complex systems, self-organized criticality, oscillations, nonlinear dynamics, bifurcations, with core emphases on electric power and energy systems and energy infrastructure.



**Sairaj Dhople** received the B.S., M.S., and Ph.D. degrees in electrical engineering, in 2007, 2009, and 2012, respectively, from the University of Illinois at Urbana-Champaign. He is currently an Assistant Professor in the Department of Electrical and Computer Engineering at the University of Minnesota (Twin Cities), where he is affiliated with the Power and Energy Systems research group. His research interests include modeling, analysis, and control of power electronics and power systems with a focus on renewable integration.



**Santiago Grijalva** Santiago Grijalva, is the Director of the Power Systems Engineering Center (PSEC) at NREL, where he leads transformational research on Future Sustainable Electricity Systems. PSEC focuses on transmission and distribution integration of renewable energy, smart grid and advanced controls, emerging electricity markets, and energy cyber-physical systems. Dr. Grijalva's background is on real-time power system operations, power system economics, and computer science. He came most recently from the Georgia Institute of Technology, where he held the position of Georgia Power Distinguished Professor and Strategic Energy Institute Associate Director for Electricity. Dr. Grijalva has been a leading researcher on ultra-reliable architectures for critical energy infrastructures. He has pioneered work on de-centralized and autonomous power system control, renewable energy integration in power, and unified network modeling and simulation. He has been the principal investigator of various future electricity grid research projects for the US Department of Energy, ARPA-E, EPRI, PSERC as well as other Government organizations, research consortia, and industrial sponsors. He was also a software architect and developer of innovative real-time and optimization applications used today by utilities and energy control centers in many countries. Dr. Grijalva has published widely in the power systems literature, and has been the recipient of various fellowships including the Organization of American States (OAS), Fulbright, and University of Illinois, as well as various awards including the 2012 Georgia Tech Outstanding Young Faculty, and the 2013 Hispanic Engineer National Achievement Award Conference (HENAAC) for Great Minds in STEM. His graduate degrees in Electrical and Computer Engineering are from The University of Illinois at Urbana-Champaign.



**Sudip K. Mazumder** is the Director of Laboratory for Energy and Switching-Electronics Systems and a Professor in the Department of Electrical and Computer Engineering at UIC. He has over 22 years of professional experience and has held R&D and design positions in leading industrial organizations and has served as Technical Consultant for several industries. Dr. Mazumder also serves as the President of **NextWatt LLC**, a small business organization that he setup in 2008. His current areas of interests are a) Interactive power-electronics/power networks, smart grid, and energy storage; b) Renewable and alternative energy based power electronics systems for distributed generation and microgrid; and c) Optically-triggered wide-bandgap power-electronics device and control technologies and SiC and GaN device based high-frequency, high-temperature, and high-voltage power electronics. Since joining UIC in 2001, Dr. Mazumder has been awarded about 40 sponsored projects by NSF, DOE, ONR, ARPA-E, CEC, EPA, AFRL, NASA, NAVSEA, and multiple leading industries in above-referenced areas. He has published over 150 refereed papers in prestigious journals and conferences and has published 1 book and 6 book chapters. About 50% of his journal papers are published in IEEE transactions with a current impact factor close to 5. Dr. Mazumder has presented 47 invited/plenary/keynote presentations and currently, he also holds 7 issued and 3 pending patents. Dr. Mazumder received his Ph.D. degree from the Department of Electrical and Computer Engineering of the Virginia Polytechnic and State University (VPI&SU - also known as Virginia Tech) in 2001. He received his M.S. degree from the Department of Electrical Power Engineering of the Rensselaer Polytechnic Institute (RPI) in 1993. He received his B.E. degree from the Department of Electrical Engineering of University of Delhi, India in 1989 with distinction.



**Dhananjay S. Phatak** earned a PhD degree in Computer Engineering from the University of Massachusetts, Amherst (UMASS) in 1993, the MSEE degree in Microwave Engineering also at UMASS in 1990, and the B. Tech degree in Electrical Engineering from the Indian Institute of Technology (IIT), Mumbai (Bombay), India, in 1985. Currently, he is an associate professor of computer science at the University of Maryland, Baltimore County (UMBC) in the CSEE Dept., and a member of UMBC's Center for Cybersecurity as well as the Cyber Defense Laboratory. His main research interests currently include all aspects of cyber-security (including computing/networks/systems/information/hardware/software...security), privacy/anonymity, Virtualization and allied areas; computer arithmetic algorithms and their hardware realizations; number theory; and cryptology. Dr. Phatak has been a member of the technical program committee of the IEEE Biannual symposium on Computer Arithmetic (IEEE-ARITH) from 1999 through 2009. He also served a three-year term as an Associate Editor of the IEEE Transactions on Computers from January 2002 through December 2005. He was a recipient of the National Science Foundation's (NSF) Career Award in 1999. For further information, please see <http://www.csee.umbc.edu/~phatak/>.



**Tariq Samad** is Corporate Fellow at Honeywell Automation and Control Solutions, based in Minneapolis, U.S.A. His career with Honeywell has spanned 25 years, during which time he has contributed to, and led, automation and control technology developments for applications in electric power systems, the process industries, building management, automotive engines, unmanned aircraft, and clean energy. His research interests relate broadly to automation, intelligence, and autonomy for complex engineering systems. Dr. Samad is a Fellow of the IEEE and the recipient of several awards including the 2008 IEEE CSS Control Systems Technology Award. He served as the President of IEEE Control Systems Society in 2009 and he will be the President Elect for the American Automatic Control Council in 2012. He was editor-in-chief of IEEE Control Systems Magazine from 1998 to 2003. He was the Program Chair for the 2004 IEEE International Symposium on Intelligent Control (Taiwan) and he is the General Chair for the 2012 American Control Conference (Montréal). Dr. Samad holds 17 patents and has authored or coauthored over 100 publications, including the recent online report, The Impact of Control Technology ([ieeecss.org/main/loCT-report](http://ieeecss.org/main/loCT-report)). He currently serves on the editorial board of IEEE Press. He represents Honeywell on the Global Carbon Capture and Storage Institute and he is a member of the Governing Board of the U.S. Smart Grid Interoperability Panel. Dr. Samad holds a B.S. degree in Engineering and Applied Science from Yale University and M.S. and Ph.D. degrees in Electrical and Computer Engineering from Carnegie Mellon University.



**Vijay Vittal** received the B.E. degree in electrical engineering from the B.M.S. College of Engineering, Bangalore, India, in 1977; the M.Tech. degree in electrical engineering from the Indian Institute of Technology, Kanpur, India, in 1979; and the Ph.D. degree in electrical engineering from Iowa State University, Ames, in 1982. Currently he is the Ira A. Fulton Chair Professor in the School of Electrical, Computer and Energy Engineering at Arizona State University. From 1982 - 2004 he served as a faculty member at Iowa State University. His research interests are in the area of power system dynamics, dynamic security assessment of power systems, power system operation and control, and application of robust control techniques to power systems. He is the author and co-author of several papers in his field. In 1992 he co-authored the textbook entitled Power System Transient Stability Assessment Using the Transient Energy Function Method with A. A. Fouad, in 1999 he co-authored the textbook entitled Power System Analysis with A. R. Bergen, and in 2012 he co-authored the textbook entitled Grid Integration and Dynamic Impact of Wind Energy with Raja Ayyanar. During 1993-1994 he was the Program Director of the Power Systems Program at the U. S. National Science Foundation. He is a recipient of the 1985 Presidential Young Investigator Award. In 1997, he was elected as a Fellow of IEEE for contributions "to the development of the transient energy function method and its application to power system dynamic security assessment, and for leadership in power engineering education and research." He was also the recipient of the 2000 IEEE Power Engineering Society Outstanding Power Engineering Educator Award. From 1998-2000 he was the Chairman of the IEEE Power Engineering Society System Dynamic Performance Committee. He was the technical program chair for the 2001 IEEE PES Summer Power Meeting. In 2003 he was elected to the U.S. National Academy of Engineering in 2004. From 2005-2011 he served as

the Editor in Chief of the IEEE Transactions on Power Systems. In 2013 he was awarded the IEEE Herman Halperin T&D Field Award. Since 2005 Dr. Vittal has also served as the Director of the Power System Engineering Research Center, a Phase III National Science Foundation, Industry/University Collaborative Research Center consisting of 13 member universities and 40 industry members.



**Jin Wang** received a B.S. degree from Xi'an Jiaotong University, in 1998, an M.S. degree from Wuhan University, in 2001, and a Ph.D. from Michigan State University, East Lansing, in 2005, all in electrical engineering. From Sept., 2005 to Aug. 2007, he worked at the Ford Motor Company as a Core Power Electronics Engineer. In September 2007, he joined The Ohio State University as an Assistant Professor. He was promoted to Associate Professor with Tenure in 2013. His

research interests include wide bandgap device based power electronics circuit topologies, interface for renewable energy resources, power electronics for transportation electrification, and utility applications of high voltage and high power converters. Dr. Wang received the IEEE Power Electronics Society Richard M. Bass Young Engineer Award and the National Science Foundation's CAREER Award in 2011, Ralph L. Boyer Award for Excellence in Undergraduate Teaching Innovation from the College of Engineering at The Ohio State University in 2012, and the Lumley Research Award of the College of Engineering at The Ohio State University in 2013. Dr. Wang has over 70 peer-reviewed journal and conference publications and two patents. Dr. Wang has been an Associate Editor for IEEE Transactions on Industry Application since March 2008. In 2013, Dr. Wang served as the General Chair for the 1st IEEE Workshop on Wide Bandgap Power Devices and Applications.

## Government Sponsors



**Keith Marzullo** is currently the Division Director for the Computer and Network Systems (CNS) Division in the Computer and Information Science and Engineering (CISE) Directorate at the National Science Foundation. He is at NSF on leave from the Computer Science and Engineering Department at the University of California, San Diego. He has been on the UCSD faculty since 1993. He received his Ph.D. in Electrical Engineering from Stanford University in 1984; for his

Ph.D. he developed the Xerox Research Internet Clock Synchronization protocol, which was one of the first practical fault-tolerant protocols that addressed this issue. In 1986, he left Xerox and joined the CS Department at Cornell University where with colleagues Ken Birman and Robert Cooper, he started the company ISIS Distributed Systems, which provided middleware for fault tolerant distributed applications; this software was used by financial and investment institutions. He served as a Professor at Large in the Computer Science Department at the University of Tromso from 1999-2003, was Chair of ACM SIGOPS from 2003-2007, and Chair of the CSE Department from 2006-2010. His current research focuses on issues in distributed systems and security. He is a Fellow of the ACM.



**David Corman** earned his Ph.D. in Electrical Engineering at the University of Maryland in 1983. He has had a distinguished career, starting at the Johns Hopkins Applied Physics Laboratory from 1978-1983. There he developed tracking and surveillance algorithms. His background also includes thirty years at Boeing in the areas of cyber physical systems (CPS) including unmanned vehicles, networked systems, and cyber security. He has been principal investigator for multiple DARPA and Air Force Research Laboratory projects focused in

technologies for advanced avionics systems, design and manufacturing, cyber security, and unmanned systems control. He joined the National Science Foundation as a program director in March 2013 and leads the CPS Program