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VANCOUVER IEEE DAY 2017

Vancouver Section

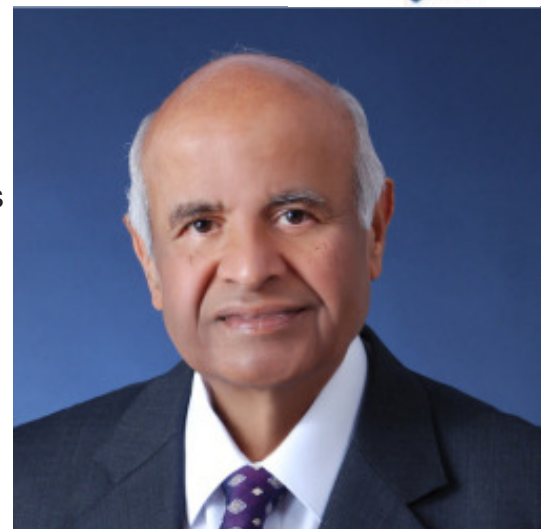


Come celebrate IEEE Day with us!

WHERE: Creekside Community Centre (right beside Science World)
WHEN: Tuesday 03 October at 5:00PM

- 17:00 — Registration and networking
- 17:30 — Presentations
 - Video presentations from Victoria, Portland & Seattle sections
 - Topics of interest for Vancouver IEEE community: volunteering, initiatives
 - Address by Professor Vijay K Bhargava "Journey in the IEEE World"
- 18:30 — Annual photo-op in front of Vancouver IEEE Monument
- 19:00 — Monthly Vancouver Section executive meeting

Participation is free, but we ask that you register to help us order enough refreshments: <https://events.vtools.ieee.org/m/46947>
For more info: Guillaume Boisset at guillaume@ieee.org



Professor Vijay K. Bhargava of UBC
* Past President IEEE Communications Society
• Past President IEEE Information Theory Society
• Distinguished Speaker multiple IEEE Societies





Alvin Loke
Qualcomm

Seminar 1

Confessions of an IC engineer: Things I wished I knew way back when I started my career

You are a young and impressionable techie, soon to graduate with a fantastic UBC education and embark onto a professional career in engineering. Unfortunately, the real world will likely not be as objective and technical as your university experience.

This seminar is my humble attempt to offer candid and politically incorrect career advice as I reflect back

on my 19 years so far as a technical contributor in this insane-paced IC industry. I will tackle topics such as navigating your career, looking for mentors, politics in the workplace, and importance of networking with a mix of hopefully entertaining yet enlightening anecdotes and hard lessons.

A DOUBLE HEADER

Seminar 1

Friday 29 September

4:00 to 5:00 pm

Rm 228 MacLeod Bldg
2356 Main Mall, UBC

Seminar 2

Friday 29 September

5:00 to 6:30 pm

Rm 228 MacLeod Bldg
2356 Main Mall, UBC

Seminar 2

Analog/mixed-signal design in FinFET technologies

Consumer demand for low-power mobile ICs has propelled CMOS scaling to arrive at the fully depleted finFET with foundry offerings already available at 16/14, 10, and 7 nm. The compact three-dimensional structure of the finFET offers superior short-channel control that achieves digital power reduction while increasing device performance for a given area. As system-on-chip technology remains driven by logic and SRAM scaling needs, designers of analog/mixed-signal subsystems must continue to adapt to new technology constraints.

We attempt to summarize the challenges and technology considerations encountered when we port analog/mixed-signal designs to a finFET node. At 16/14 nm and beyond, designers also face many implications from scaling innovations leading to the finFET such as mechanical stressors, high-K gate dielectric and metal gate, multiple and spacer-based patterning, and a very complex middle-end-of-line.

Speaker: Alvin Loke received a B.A.Sc. in engineering physics with highest honors from UBC in 1992, and M.S. and Ph.D. in electrical engineering from Stanford in 1994 and 1999 respectively. He worked on CMOS process integration for several years at HP Labs and on assignment at Chartered Semiconductor. Since 2001, he has been designing CMOS circuits for a variety of wireline links and addressing next-generation CMOS analog/mixed-signal concerns at Agilent and Advanced Micro Devices in Fort Collins, CO, and most recently at Qualcomm in San Diego, CA. Alvin is currently a principal engineer working on next-generation SerDes for mobile ICs. He has authored several dozen publications and holds 21 US patents. Alvin has served as a Technical Program Committee member of CICC, IEEE Chapter Chair, Guest Editor of the IEEE Journal of Solid-State Circuits, Industrial Advisory Board member at Colorado State University, and IEEE Distinguished Lecturer. He recently joined the technical committee of the VLSI Symposia.

Information
Solid-state Circuits Chair
Shahriar Mirabbasi
shahriar@ece.ubc.ca



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The fundamental building blocks of a “theory of everything” under a unified theory of analytical integration

Mike Mikalajunas
Futurion Associates

Friday 13 October

6:00 pm to 7:30 pm

2270 Sauder Industries
Policy Room,
SFU Harbour Centre
515 West Hastings St
Vancouver

Light refreshments served.
Open to public.

We would greatly appreciate if you would please register so that we may more accurately estimate the room size and refreshments.



IEEE Circuits and
Systems Society
joint Chapter of the
Vancouver/Victoria
Sections

Information

Circuits and Systems
Chair Ljiljana Trajkovic
ljilja@cs.sfu.ca

By targeting a very specific type of algorithm that would be constructed from the use of differentials defined in a very unique algebraic configuration, this has succeeded in exposing what appears to be a complete unified theory of analytical integration in Calculus. The unique mathematical properties of this algorithm could be exploited much further for establishing the basic fundamental building blocks of what is known today as the theory of everything. Under such a unified theory of integration, the analytical solutions of all fundamental PDEs of Physics and Engineering may now be potentially resolved in their complete original form thereby avoiding the uncertainty of having to apply various types of transformation processes just for reducing the PDEs to more integrable type.

The classical definition of the theory of everything according to many physicists is a hypothetical single, coherent theoretical framework of physics that fully explains and links together all physical aspects of the universe. We ask ourselves “how can such a grandiose physical theory for explaining everything about this universe be possible without the application of an equivalent grandiose mathematical theory that would explain everything about the complete integration of all differential equations (DEs) “.

Since DEs are universal and not linked to any specific area of the Physical Sciences there is no evidence to support that Modern Physics is the only subject by which a complete theory of everything may be entirely constructed from. Instead, it is only by consolidating the general analytical solutions of all PDEs describing a unique physical system such as the Maxwell equations, the Einstein Field equations and the Navier-Stokes equations all in terms of fundamental theorems that would lead to the construction of some gigantic theory capable of explaining everything about our physical universe. This of course can only be possible under a complete unified theory of analytical integration such as the one that will be presenting in this talk.

Speaker: Mike Mikalajunas has a degree in Mechanical Engineering with a specialization in fluid mechanics. He has taken part in a number of research projects with various other faculty members that would include a long term flight simulation project in conjunction with Canadian Aviation Electronics (CAE) and also some extensive research and development work related to mechanical vibrations. There were also a number of specialized computer projects he had been involved in with a computer science department that would include some development work for the software program AUTO (continuation and bifurcation problems in ordinary differential equations).

Back in the mid 80’s the PC hardware and software industry was in the process of becoming more and more evolved for the health care industry. Mike Mikalajunas along with Dr. Robert Carbone has founded a software company specifically for providing much greater software accessibility of the PC to various large manufacturing corporations.

Because of his extensive software involvement with this consulting company, he has been assigned to maintain and support the company’s leading statistical software within Boehringer Ingelheim pharmaceutical division and at Novartis Animal Health division which is now owned by Elanco a division of Eli Lilly. Under a special software license agreement he would be responsible for running the sales forecasting and assumption reporting software on a monthly basis for all international division of both Boehringer Ingelheim and Novartis in order to meet each of their own total manufacturing process requirements.

The growing popularity of the unique approach to integration by the proposed method of differentials has resulted into a number of independent requests for giving many such presentations to various other leading universities in both Canada and in the US. The same type of presentations were also given in the past to various major conferences as far away as in New Zealand involving pure and applied mathematics as well as in computational physics and engineering.

Registration: https://events.vtools.ieee.org/meeting_registration/register/47214



Seth R. Sanders
UC Berkeley

Flywheel energy storage: The utility scale energy storage solution

Energy storage is now emerging as an essential electric utility resource to effectively enable higher penetration levels of variable renewable generation resources. In California, in response to RPS mandates for increased renewable penetration, Assembly Bill 2514, in conjunction with CPUC rulings, has called for 1.3 GW of flexible energy storage to be incorporated into the energy mix by the three California IOUs during the next few years. Similar actions are being followed in other U.S. states, and worldwide.

The talk will review the energy storage landscape, in terms of opportunity, established and emerging storage technologies, and commercial progress. The talk will also focus on the speaker's interests in advancing flywheel energy storage to meet utility scale challenges. In short, a flywheel functions as a battery, with kinetic energy storage replacing conventional electrochemical processes. Based on numerous implementations and products released during the past 20-30 years, there has been a general belief in the power systems community that flywheels are only suited to short term applications, for example in frequency regulation, grid stability enhancement, voltage support, and in UPS and transit system applications.

This is not the case, and the talk will outline how flywheels can be economically designed to meet multi-hour energy shifting applications, that are essential for provision of capacity, and extended integration of variable renewable generation. Some details on product and project development at grid scale energy storage start-up Amber Kinetics will be discussed.

Speaker: Seth R. Sanders is Professor in the Department of Electrical Engineering and Computer Sciences at the University of California, Berkeley. He received S.B. degrees (1981) in Electrical Engineering and Physics, and the S.M. (1985) and Ph.D. (1989) degrees in Electrical Engineering from the Massachusetts Institute of Technology, Cambridge. Following an early experience as a Design Engineer at the Honeywell Test Instruments Division in 1981-83, he joined the UC Berkeley faculty in 1989.

Dr. Sanders is co-founder and Chief Scientist of Amber Kinetics, Inc., a technology developer, manufacturer, and project developer of utility scale flywheel energy storage systems. His technical interests are in electrical energy and power conversion systems. Dr. Sanders is presently or has recently been active in supervising research projects in the areas of flywheel energy storage, high frequency integrated power conversion circuits, IC designs for power conversion applications, electric machine design, and renewable energy systems. During the 1992-1993 academic year, he was on industrial leave with National Semiconductor, Santa Clara, CA.

Dr. Sanders received the NSF Young Investigator Award and multiple Best Paper Awards from the IEEE Power Electronics and the IEEE Industry Applications Societies. He has served as Chair of the IEEE PELS Technical Committee on Computers in Power Electronics, Chair of the IEEE PELS Technical Committee on Power Conversion Components and Systems, and as Member-At-Large of the IEEE PELS Adcom. He is an IEEE Fellow, a Distinguished Lecturer of the IEEE PELS and IAS societies, and recipient of the IEEE PELS Modeling and Control Technical Achievement Award.

Distinguished Lecturer

Monday 30 October

3:00 — 4:00 pm

Fred Kaiser Bldg

2332 Main Mall

UBC

Register: <http://events.vtools.ieee.org/m/46917>

Information
Power Electronics chair
Martin Ordonez
mordonez@ieee.org



IEEE EDS Vancouver Mini-Colloquium (MC): Integrating Nano/Micro Electronic & Related Devices

Date:
02 October 2017

Time:
09:30 to 16:30

Location:
ASB 9896, Applied Sciences Building, Simon Fraser University, 8888 University Dr, Burnaby, Canada

Breakfast, Lunch, and Coffee Breaks will be catered

Space is limited
To reserve your seat, please RSVP your first and last name to:
bgray@sfu.ca and mmadachi@sfu.ca

Please look on the SFU web site for room location and directions; organizers will only confirm reservation via email.

Sponsored by: IEEE Electron Devices Society (EDS), National Science and Engineering Research Council (NSERC), Simon Fraser University

The Vancouver IEEE EDS hosts the following four EDS Distinguished Lecturers from academia, government, and commercial laboratories on the topic of micro/nano devices and systems:



Dr. Meyya Meyyappan
NASA Ames Research Center
Title: Something Different: Nanoscale Vacuum Electronics



Prof. Mina Rais-Zadeh
U. of Michigan
Title: Gallium Nitride Based Integrated Microsystems



Prof. Paul Berger
The Ohio State University
Title: Highly repeatable room temperature negative differential resistance in AlN/GaN resonant tunneling diodes



Dr. Héctor J. De Los Santos
NanoMEMS Research, LLC
Title: Theory of Nano-Electron-Fluidic Logic (NFL): A New Digital "Electronics" Concept

Agenda

- | | |
|--------------------|--|
| 9:30 am - 9:50 am: | Coffee/Continental breakfast (catered) |
| 9:50 am: | Welcome address |
| 10 am - 11 am: | Mina Rais-Zadeh, Assoc. Professor, U. of Michigan |
| 11 am - 12 pm: | Paul Berger, Professor, Ohio State University |
| 12 pm - 12:50 pm: | Lunch break and networking (catered) |
| 12:50 pm - 1 pm: | Afternoon welcome |
| 1 - 2pm: | Meyya Meyyappan, Chief Scientist for Exploration Technology, NASA Ames Research Center |
| 2 - 2:30pm: | Coffee break (catered) |
| 2:30 - 3:30pm: | Hector De Los Santos, Founder, NanoMEMS Research |
| 3:30 - 4:30pm: | Panel Discussion |
| 4:30pm: | Closing remarks |



IEEE EDS Vancouver Mini-colloquium, Date: Oct 2nd, 2017, 9:30 am -4:30 pm

Location: ASB 9896, Simon Fraser University, Burnaby, BC, Canada



Dr. Meyya Meyyappan
NASA Ames Research Center
Moffett Field, CA 94035

Title: Something Different: Nanoscale Vacuum Electronics

Abstract: We have been fabricating nanoscale vacuum tubes over the last three years using entirely and exclusively silicon technology. Vacuum is superior to any semiconductor in terms of electron transport, in addition to being immune to all radiations. We have combined the best of vacuum transport and silicon technology to fabricate surround gate nanoscale vacuum transistors on 8 " wafers with a channel dimension of 50 nm. These vacuum transistors, operating at a drive voltage of only 2 V, which is remarkable for vacuum devices, have the potential for THz electronics and several other applications. This talk will also provide an overview of our recent activities in printable electronics including gas sensors, antennas and triboelectric nanogenerators. To enable a one-step printing without the need for post-deposition thermal treatment, we have developed an atmospheric pressure plasma jet printing technology. This is an alternative to inkjet printing for depositing conducting, semiconducting, insulating and other materials on a variety of flexible substrates. The author thanks Jin-Woo Han, Ram Prasad Gandhiraman, Jessica Kohene, Dongil Moon, Myeonglok Seoul, Sunjin Kim, Daniel Kim, Kyung Jean Yoon, Furman Thompson and Niki Werkheiser.

Biography: Meyya Meyyappan is Chief Scientist for Exploration Technology at NASA Ames Research Center in Moffett Field, CA. Until June 2006, he served as the Director of the Center for Nanotechnology. He is a founding member of the Interagency Working Group on Nanotechnology (IWGN) established by the Office of Science and Technology Policy (OSTP). The IWGN is responsible for putting together the National Nanotechnology Initiative.

Dr. Meyyappan has authored or co-authored over 360 articles in peer-reviewed journals and made over 250 Invited/Keynote/Plenary Talks in nanotechnology subjects across the world and over 200 seminars at universities. His research interests include carbon nanotubes, graphene, and various inorganic nanowires, their growth and characterization, and application development in chemical and biosensors, instrumentation, electronics and optoelectronics. Dr. Meyyappan is a Fellow of the Institute of Electrical and Electronics Engineers (IEEE), Electrochemical Society (ECS), American Vacuum Society (AVS), Materials Research Society (MRS), Institute of Physics (IOP), American Institute of Chemical Engineers (AIChE), American Institute of Mechanical Engineers (ASME), National Academy of Inventors, and the California Council of Science and Technology. He is currently the IEEE Electron Devices Society (EDS) Distinguished Lecturer, and was the Distinguished Lecturer on Nanotechnology for both the IEEE Nanotechnology Council and ASME. For his contributions and leadership in nanotechnology, he has received numerous awards including: a Presidential Meritorious Award; NASA's Outstanding Leadership Medal; Arthur Flemming Award given by the Arthur Flemming Foundation and the George Washington University; IEEE Judith Resnick Award; IEEE-USA Harry Diamond Award; AIChE Nanoscale Science and Engineering Forum Award; Distinguished Engineering Achievement Award by the Engineers' Council; Pioneer Award in Nanotechnology by the IEEE-NTC; Sir Monty Finnieston Award by the Institution of Engineering and Technology (UK); Outstanding Engineering Achievement Merit Award by the Engineers' Council; IEEE-USA Professional Achievement Award; AVS Nanotechnology Recognition Award; IEEE Nuclear and Plasma Sciences Society Merit Award; Distinguished Grumman Project Engineering Award by the Engineers' Council. For his sustained contributions to nanotechnology, he was inducted into the Silicon Valley Engineering Council Hall of Fame in 2009. He received an Honorary Doctorate in 2015 from the University of Witwatersrand, Johannesburg, South Africa for his scientific contributions. For his educational contributions, he has received: Outstanding Recognition Award from the NASA Office of Education; the Engineer of the Year Award (2004) by the San Francisco Section of the American Institute of Aeronautics and Astronautics (AIAA); IEEE-EDS Education Award; IEEE-EAB (Educational Activities Board) Meritorious Achievement Award in Continuing Education.

IEEE EDS Vancouver Mini-colloquium, Date: Oct 2nd, 2017, 9:30 am -4:30 pm
Location: ASB 9896, Simon Fraser University, Burnaby, BC, Canada



Dr. Paul R. Berger
Professor
The Ohio State University
Columbus, OH

Title: Highly repeatable room temperature negative differential resistance in AlN/GaN resonant tunneling diodes

Abstract: III-nitride RTDs have attracted a great deal of interest in recent years as they have potential to increase the power output and operating temperature of RTDs due to the large band offsets available in pseudomorphic and III-nitride heterojunctions (~2 eV for AlN/GaN). Subsequently, intraband tunneling could enable a new class of tunneling injection devices. For example, the combination of RTDs with plasmonic modes in a III-nitride HEMT structure could lead to power gain at high frequencies. AlN/GaN resonant tunneling diodes (RTD) grown on low dislocation density semi-insulating (SI) bulk GaN substrates via plasma-assisted molecular-beam epitaxy (MBE) will be reported here. The devices were fabricated using a six mask level, fully isolated process. Stable room temperature negative differential resistance (NDR) was observed. The NDR exhibited no hysteresis, background light sensitivity, or degradation of any kind after more than 1000 continuous up-and-down voltage sweeps. Results exhibited a ~90% yield of operational devices which routinely displayed an average peak current density of 2.7 kA/cm² and peak-to-valley current ratio (PVCR) of ~ 1.15 across different sizes.

Biography: Paul R. Berger (S'84 M'91 SM'97 F'11) is a Professor in Electrical & Computer Engineering at Ohio State University and Physics (by Courtesy). He is also a Distinguished Visiting Professor at Tampere University of Technology in Finland. He received the B.S.E. in engineering physics, and the M.S.E. and Ph.D. (1990) in electrical engineering, respectively, all from the University of Michigan, Ann Arbor. Currently, Dr. Berger is actively working on quantum tunneling devices, printable semiconductor devices & circuits for IoT, bioelectronics, novel devices, novel semiconductors and applied physics. Formerly, he worked at Bell Laboratories, Murray Hill, NJ (1990-'92) and taught at the University of Delaware in Electrical and Computer Engineering (1992-2000). In 1999, Prof. Berger took a sabbatical leave while working first at the Max-Planck Institute for Polymer Research, Mainz, Germany while supported by Prof. Dr. Gerhard Wegner and then moved on to Cambridge Display Technology, Ltd., Cambridge, United Kingdom working under Dr. Jeremy Burroughes. In 2008, Prof. Berger spent an extended sabbatical leave at IMEC (Interuniversity Microelectronics Center) in Leuven, Belgium while appointed as a Visiting Professor in the Department of Metallurgy and Materials Engineering, Katholieke Universiteit Leuven, Belgium. And more recently he took a sabbatical leave in 2015-2016 at Tampere University of Technology with the Prof. Don Lupo in the Printed and Organic Electronics Group. He has authored over 110 articles, 5 book sections and been issued 22 patents with 6 more pending from 60 + disclosures with a Google Scholar H-index of 33. Some notable recognitions for Dr. Berger were an NSF CAREER Award (1996), a DARPA ULTRA Sustained Excellence Award (1998), a Lumley Research Award (2006, 2011), a Faculty Diversity Excellence Award (2009) and Outstanding Engineering Educator for State of Ohio (2014). He has been on the Program and Advisory Committees of numerous conferences, including the IEDM, ISDRS, EDTM meetings. He currently is the Chair of the Columbus IEEE EDS/Photonics Chapter and Faculty Advisor to Ohio State's IEEE Student Chapters. He is a Fellow and Distinguished Lecturer of IEEE EDS and a Senior member of Optical Society of America.



Dr. Mina Rais-Zadeh
Associate Professor
University of Michigan
Ann Arbor, Michigan

Title: Gallium Nitride Based Integrated Microsystems

Abstract: In the last few years we have seen rapid growth of III-V semiconductors geared towards a variety of applications where silicon performance falls short. GaN, a III-V semiconductor, is proven to be the material of choice for high-frequency, high-power, and high-temperature applications. GaN also offers a number of excellent mechanical properties, making it a suitable material for MEMS. This talk discusses the application of GaN micromechanical devices in timing and integrated sensing.

Biography: Mina Rais-Zadeh received the B.S. degree in electrical engineering from Sharif University of Technology and M.S. and Ph.D. degrees both in Electrical and Computer Engineering from Georgia Institute of Technology in 2005 and 2008, respectively. From 2008 to 2009, she was a Postdoctoral Research Fellow at Georgia Institute of Technology. In 2009, she joined the University of Michigan, Ann Arbor, as an Assistant Professor of Electrical Engineering and Computer Science (EECS). Since 2014, she has been an Associate Professor in EECS with courtesy appointment in the Department of Mechanical Engineering. She is currently at NASA JPL and on leave of absence from U. of Michigan.

Dr. Rais-Zadeh is the recipient of the NSF CAREER Award (2011), IEEE Electron Device Society Early Career Award (2011), NASA Early Career Faculty Award (2012), the Crosby Research Award from the University of Michigan (2013), National Academy of Engineering Frontiers of Engineering (2013), ONR Young Investigator Award (2014), IEEE Sensors Council Early Career Technical Achievement Award (2015), and University of Michigan EECS Outstanding Achievement Award (2016). Together with her students, she received the best poster award at the Transducers conference (2013), the best paper award at the IEEE SiRF conference (2014, 2016), honorable mention at the IEEE IMS (2014), and was the finalist in student paper competitions at the SiRF (2007) and IMS (2011) conferences. She is an associate editor for the IEEE Journal of Microelectromechanical Systems (JMEMS) and on editorial board of Nature Scientific Reports. Her research interests include electron devices for wireless communication and sensing applications and the related device physics, resonant micromechanical devices, RF MEMS, gallium nitride MEMS, and micro/nano fabrication process development.

IEEE EDS Vancouver Mini-colloquium, Date: Oct 2nd, 2017, 9:30 am -4:30 pm
Location: ASB 9896, Simon Fraser University, Burnaby, BC, Canada

Dr. Héctor J. De Los Santos
NanoMEMS Research, LLC
Irvine, California 92604 USA

Title: Theory of Nano-Electron-Fluidic Logic (NFL): A New Digital “Electronics” Concept

Abstract: As predicted by Gordon Moore more than 40 years ago, the number of transistors able to fit on a computer chip has doubled approximately every 18 months. But if the trend is to continue for the years to come, it will have to be with technology other than the conventional CMOS design. As the size of transistors gets down to the nanoscale, CMOS devices begin to suffer from several issues, in particular, increased resistance, decreased channel mobility, and increased manufacturing costs. To overcome the challenges involved with scaling, researchers from around the world have begun to look for alternatives to CMOS technology. Our recently introduced concept, called nano-electron-fluidic logic (NFL), is based, not on electron particle transport, but on the generation, propagation, and manipulation of surface plasma waves (plasmons) in an electron fluid. NFL gates are projected to exhibit femtojoule power dissipations and femtosecond switching speeds at finite temperatures, while taking full advantage of established semiconductor manufacturing infrastructure. NFL represents a paradigm shift in digital technology, and is poised as a strong candidate for “beyond-CMOS” digital logic. This talk presents the theory, physics and design principles of NFL.

Biography: Héctor J. De Los Santos received the Ph.D. degree in electrical engineering from Purdue University, West Lafayette, IN, in 1989. He founded NanoMEMS Research, LLC, Irvine, CA, a company engaged in Nanoelectromechanical Quantum Circuits and Systems (NEMX) and RF MEMS (NanoMEMS) research, consulting, and education, where he focuses on discovering fundamentally new devices, circuits and design techniques. Prior to founding NanoMEMS in 2002, he spent two years as a Principal Scientist, RF MEMS, at Coventor, Inc., Irvine, CA. From 1989 to 2000, he was with Hughes Space and Communications Company, Los Angeles, CA, where he served as Principal Investigator and the Director of the Future Enabling Technologies IR&D Program. Under this program he pursued research in RF MEMS, quantum functional devices and circuits and photonic bandgap crystal devices and circuits. He holds over 30 U.S., European, German and Japanese patents and is author of bestseller textbooks, including, *Introduction to Microelectromechanical (MEM) Microwave Systems*, Norwood, MA: Artech House, 1999 [This book was the first in the RF MEMS field and has become an Artech House classic, now being in their IPF[®] (In-Print-Forever[®]) program], *RF MEMS Circuit Design for Wireless Communications*, Norwood, MA: Artech House, 2001, and *Principles and Applications of NanoMEMS Physics*, Dordrecht: The Netherlands: Springer, 2005. His most recent book, *Radio Systems Engineering: A Tutorial Approach*, was published by Springer, New York, in 2014. His research interests include, theory, modeling, simulation, design and demonstration of emerging devices (electronic, plasmonic, nanophotonic, mechanical systems in the quantum regime, etc.), and wireless communications.

During the 2010-11 academic year he held a German Research Foundation (DFG) *Mercator Visiting Professorship* at Institute for High-Frequency Engineering and Electronics, Karlsruhe Institute of Technology/University of Karlsruhe, Germany, where his activities included teaching, and conducting research on his DFG-funded project "Nanoelectromechanical Interferometric Tuning with Non-Equilibrium Cooling for Microwave and mm-Wave Electronics". From 2001-2003 he lectured worldwide as an IEEE Distinguished Lecturer of the Microwave Theory and Techniques Society. Since 2006 he has been an IEEE Distinguished Lecturer of the Electron Devices Society. He is a member of Tau Beta Pi, Eta Kappa Nu and Sigma Xi. He is an IEEE Fellow.



Hongseok Kim
Sogang Univ, Korea

Friday 29 September

11:00am

Rm 418 Macleod Bldg
2356 Main Mall, UBC

Everyone is welcome!

Information

Colleen Brown
colleenb@ece.ubc.ca

Gaussian residual bidding-based coalitional framework for renewable energy market

To stabilize output variability of distributed renewable energy sources (RESs), integrating large-scale RESs is highly utilized, and aggregated RESs are treated almost as any other conventional generators in existing electricity markets. In this talk we first propose a coalitional framework to cope with the uncertainty of RESs when RES owners can participate in a wholesale electricity market as sellers, where a market operator financially penalizes RES owners for deviations between day-ahead and real-time markets.

Our theoretical approach incentivizes participants in a coalition by mitigating penalty fees caused by renewable variability. Furthermore, we propose a bidding strategy called Gaussian residual bidding (GRB) to maximize a coalition gain of participants. We prove that the considered game is convex game when GRB is used for all participants. Our extensive simulations with real data demonstrate that the proposed bidding strategy combined with the coalitional framework outperforms other bidding strategies as well as non-coalition cases under various market scenarios. Our results exhibit the revenue of GRB is improved up to 200% compared to the existing

empirical quantile bidding and forecast bidding strategies.

Speaker: Dr. Hongseok Kim is an Associate Professor at Sogang University, Seoul, Korea. He received the B.S. and M.S. degrees in electrical engineering from Seoul National University, Seoul, South Korea, in 1998 and 2000, respectively, and the Ph.D. degree in electrical and computer engineering from the University of Texas at Austin, Austin, TX, USA, in 2009. From 2000 to 2005, he was a Member of the Technical Staff in Korea Telecom Labs.

From 2009 to 2010, he was a Postdoctoral Research Associate in the Department of Electrical Engineering, Princeton University, Princeton, NJ, USA, and from 2010 to 2011, as a Member of technical staff in Bell Labs, Murray Hill, NJ, USA. His research interests include resource allocation, optimization and machine learning with applications to smart grid and wireless networks such as optimal power flow, microgrid, energy storage and battery management system, load and renewable prediction, power economics, 5G wireless system with renewables, green communications, scheduling in MAC layer, etc.



Electrical and
Computer
Engineering





M. V. Ramana
UBC

The global future of nuclear energy

This talk will describe the current status of nuclear energy in different countries around the world and the evolution of its share in global electricity generation. It will outline the various factors that will shape the future of nuclear energy, including costs of nuclear reactor construction, trends in renewable energy and other alternatives, social and technical challenges associated with nuclear energy such as radioactive waste disposal and the linkage to nuclear weapons, the imperative to mitigate climate change, and some of the other interests propelling continued investment in nuclear energy.

Ramana will lead a short Q&A regarding the present and likely future of nuclear energy in Canada.

Speaker: M. V. Ramana (Ph.D. Boston University; M.Sc Indian Institute of Technology Kanpur) is the Simons Chair in Disarmament, Global and Human Security at the Liu Institute for Global Issues, UBC.

His research interests are in the broad areas of international security and energy supply, with a particular focus on topics related to nuclear energy and fissile materials that can be used to make nuclear weapons. He combines technical skills and interdisciplinary methods to address policy relevant

questions related to security and energy issues. Ramana is the author of *The Power of Promise: Examining Nuclear Energy in India*, Penguin Books, New Delhi (2012).

His recent work has involved studying the multiple risks associated with the acquisition and expansion of nuclear power around the world, including the linkage with nuclear weapons, the financial risks stemming from the high capital costs of reactors, the environmental risks associated with spent fuel and long-lived radioactive waste, and safety risks as a result of the potential for severe accidents like the ones at Chernobyl in 1986 and Fukushima in 2011. He has also carried out critical assessments of new reactor technologies. Earlier work has included studying the effects of nuclear explosions, accidents involving nuclear weapons, and the detection of ballistic missiles.

His work has been recognized through honors such as a Guggenheim Fellowship in 2003 and the Leo Szilard Award from the American Physical Society in 2014. He is a member of the International Panel on Fissile Materials and on the editorial board of *Energy Research & Social Science*.

M. V. Ramana [<https://liu.arts.ubc.ca/profile/m-v-ramana/>]

Wednesday 18 October

12:30 - 1:50pm

Liu Institute for Global
Issues - Caserom

6476 NW Marine Dr
UBC

No RSVP required.

Refreshments provided.

Information

Colleen Brown
colleenb@ece.ubc.ca



Electrical and
Computer
Engineering



Accepted Nominations for IEEE Vancouver 2018 Elected Positions

The Nominations Committee is pleased to announce a slate of candidates for most elected positions within the Vancouver Section. You will note that there are some positions listed as vacant. These positions have not yet received confirmation that someone is willing to stand for office. If any of these positions interests you please contact Lee Vishloff (nominations committee chair) at lee@vishloff.ca to state your interest.

Also, if you are interested in a position that is listed as having a nominee you are free to run for that position. We will hold an election for any positions that are contested as is our usual practice. The Section bylaws call for petitions as follows: Following this announcement, a minimum of twenty eight (28) days shall be allowed for additional nominations by petition. A valid petition must be signed by twelve (12) or more voting members or 1% of the Section's voting membership, whichever is fewer.

Lee Vishloff,
Chair Nominations Committee

Rama Vinnakota	Section	Past Chair
Guillaume Boisset	Section	Chair
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IEEE Vancouver is seeking a volunteer for the role of Section Secretary starting January 2018. This position involves taking minutes during our monthly executive meetings. The position annually progresses to Treasurer, Vice-chair, Chair, and Past-chair. All necessary training will be provided. Please send your expression of interest to Lee Vishloff at lee@vishloff.ca