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## Message from the chair

2012 has been another great year for IEEE Vancouver. As we wrap up the activities for the year, we can be proud of the achievements of the section, including more than 110 technical, professional, or administrative meetings and had 13 chapters, two subsections, and three affinity groups active. Our membership numbers have been rising steadily (around 3% YoY) and IEEE Canada has been a leader in new student member recruits in the world. Our section has grown to more than 2100 members.

Electronic ballots for the 2013 election has gone out to all voting members. This is the first year in many that we have had an election. Using the IEEE developed VTools voting system for the first time for this purpose, we anticipate some hiccups and would like to ask you for patience. The results of the elections will be announced shortly as the polls close on December 24th and after the deadline for this issue of Contact. There has been some positions with not enough volunteers. This is an opportunity to get involved with your section and make a difference. The new executives will have to appoint volunteers to act in roles not filled by election. Please consider getting involved.

Early in 2013, the section will also start with the new officer training session being planned. This one day workshop, prepared new

executives from section officers to chapter chairs and student executives for their volunteer role. Please contact us if interested in attending. In March, the section will have its 2013 Annual General Meeting. I urge you all to consider attending. Besides being an excellent networking event, you get to enjoy good food and better company. Please refer to the ad in this issue of Contact for the announcement of the event. Finally, as I will pass on the IEEE Vancouver Section gavel to the next elected chair in January, I wish to thank all the volunteers who selflessly helped move the section forward by providing the excellent service our members have grown used to receive through the years. I also wish to thank you, the members for the opportunity to serve and hope to see you all more involved in the section as volunteers or through attending meetings.

I have decided to have the following three in my new-year resolution list and would be very happy if you all did the same:

- donate to the IEEE Vancouver Scholarship fund in 2013
- attend at least two of the IEEE Vancouver section events in 2013
- take a colleague to one of the IEEE events in 2013

On behalf of the volunteers at IEEE Vancouver Section, I wish you and your family a safe and memorable holiday and a very happy new year.

Kouros Goodarzi

IEEE Vancouver Section chair

[krs@ieee.org](mailto:krs@ieee.org)

# Hands-On training session - multi-trace Vector Signal Analysis software

Thursday 24 January  
0930 -1130 or  
1330 -1530

Electrical & Computer Engineering  
MCLD 418  
2332 Main Mall, UBC

As designers trace the path of a signal from transmitter to antenna, or from antenna to receiver, it is often desirable to view the signal in both the time and frequency domain in order to more accurately assess the effect of system imperfections or propagation impairments on system performance. In the past, this was accomplished using oscilloscopes and spectrum analyzers in tandem but with significant limitations.

Agilent's introduction of vector signal analysis (VSA) in the 1990's shifted the focus from analog to digital signal processing and allowed data to be taken from a wide variety of front ends, from RF and baseband/IF analyzers and extending to logic analyzers, oscilloscopes, optical analyzers, and even simulation software and mathematical programs such as MATLAB®. In recent years, most major RF test and measurement equipment vendors have incorporated vector signal analysis capabilities into their product line.

Vector Signal Analysis also introduced the possibility of processing complex data and presenting more sophisticated displays that help designers identify and assess the impairments that are placing fundamental limitations on system performance. Traditional examples

of such supplementary displays including constellation diagrams and demodulated data streams. Newer examples such as the spectrogram present hundreds of spectrum measurements that reveal frequency reversals and subtle phenomena such as spurs and temporary spectral spreading when the transmitter finally settles.

In this hands-on training seminar, Agilent application engineers will guide participants through the process of using the industry's first multi-trace VSA measurement capability to analyze signals at any point in your system's block diagram, including analog and digital baseband and IF, RF and microwave subsystems. Moreover, the technique can be applied to a variety of wireless systems ranging from narrowband to ultra-wideband and SISO to MIMO.

Because this is a hands-on seminar using Agilent-supplied laptops and software, attendance at each session is strictly limited to 16 people.

Please register in advance (and indicate whether you prefer to attend the morning or afternoon session) by contacting Dave Michelson, [davem@ece.ubc.ca](mailto:davem@ece.ubc.ca)



IEEE Joint Aerospace and  
Electromagnetics Chapter

IEEE Vancouver congratulates James Maynard on receiving the

## 2013 IEEE Canada R. H. Tanner Industry Leadership Award

After becoming its founding President and CEO in 2007, Jim Maynard recognized that the Wavefront Wireless Commercialization Centre must take a broader view than its predecessors elsewhere and emphasize the entrepreneurial support, business advice and international exposure that are critical to the success of new wireless companies. Jim's vision, and his skill in recruiting an outstanding team, has ensured Wavefront's exemplary success in attracting support from, and signing agreements with, multinational companies, government organizations, and industry associations around the world. Within Canada, Wavefront has developed important alliances with companies such as



Rogers Wireless and Sierra Wireless, government departments such as DFAIT and Industry Canada, associations such as CWTA and IEEE and the many startups and SMEs that it has supported or incubated. In 2010, with strong support from UBC, Jim led Wavefront's bid to become Canada's National Centre of Excellence for the Commercialization of Wireless Technology. The R.H. Tanner Industry Leadership Award, to be formally presented during IEEE CCECE 2013 in Regina in May 2013, is fitting recognition for Jim's contributions and accomplishments.

More information about Wavefront:  
<http://www.wavefrontac.com>



Mukesh Nagpal  
BC Hydro

**Distinguished Lecturer**

Noon - 1:00  
Thursday 24 January

BC Hydro:  
Edmonds A01  
Sky train Auditorium

**Information**

Power and Energy chair  
Rama Vinnakota  
Rama.Vinnakota@bchydro.com



## Challenges of protecting BC Hydro transmission system

BC Hydro's transmission system is unusual; there are no overhead shield wires, there is high ground soil resistivity, and there are heavily loaded, long series-compensated radial transmission lines. These features make the reliable protection of 500 kV transmission lines very challenging. The absence of overhead shield wires makes the power system vulnerable to lightning faults. Ground fault detection for high soil resistivity conditions, combined with heavily loaded lines, demands a precise balance between the ability of a protection system to detect a fault, and its ability to maintain secure operation during abnormal system conditions. Finally, highly complex single-pole trip and auto-reclose schemes are designed into the 500 kV line protections to enhance the stability and security of our radially configured network.

This presentation will have two parts. The first part will discuss features of the BC Hydro transmission system and challenges they pose to its protection systems. In summer of 2011, the 500 kV transmission system experienced two similar disturbances about 13 minutes apart and each initiated was by simultaneous lightning strikes on the two lines. Protection systems on the affected lines worked correctly by temporarily disconnecting one of three faulted phases only. However, the disturbance was exacerbated, but without any customer outage, by protection mis-operation of two other healthy lines bringing north and south

transmission systems on brink of separation. This second part of the presentation will discuss this disturbance, factors that led to mis-operation of the healthy lines and lessons learnt.

**Speaker:** Mukesh Nagpal received the Ph.D. and M.Sc. degrees in electrical engineering from the University of Saskatchewan, Canada in 1990 and 1986, respectively. Dr. Nagpal is a member of IEEE-Power System Relaying Committee, a senior member of IEEE and IEEE-Power and Energy Society (PES) distinguish lecturer. He is part-time faculty at University of British Columbia and registered member of Association of Professional Engineers and Geoscientists of British Columbia (BC), Canada.

Currently, he is a Principal Engineer/Manager with the Protection and Control Planning Group within BC Hydro Engineering. He has more than 25 years of experience in electrical consulting, utility research and power system protection. Dr. Nagpal has written about 40 technical papers on power system relaying or related topics. His presentation received "Best-of-Show" award at BC Hydro's 2007 P&C Telecom Annual Technical Conference. In 2007, BC Hydro also awarded him with a prestigious "Mentorship Award" for his commitment to training and development of new engineers within and outside the organization.

## Working together in agile software development



Robert Biddle  
Carleton University

UBC Vancouver Campus  
MCLD 418  
2332 Main Mall

Thursday 10 January  
4:00 p.m.

**Information**

Computer Society chair  
Sathish Gopalakrishnan  
sathish@ece.ubc.ca

Software development typically involves working together in teams, both to increase the scale of effort and to leverage diverse skills and viewpoints. Agile processes have emphasized aspects of development that relate to such collaboration and teamwork, especially in an iterative framework. This talk reviews several field studies we have conducted of agile teams, and presents a summary of our findings, relating especially to the different skills involved in the software development process. We identify some key dynamics we feel are at the heart of agility, and consider how these might inform practice, both in software development and in related areas such as security and analysis.

**Speaker:** Robert Biddle is a Professor at Carleton University in Ottawa, Canada, where he is cross-appointed to the School of Computer Science and the Institute of Cognitive Science. His research area is Human-Computer Interaction, and especially in the contexts of software development and computer security. Recent projects include studies of collaboration in software development, and design and evaluation of innovative approaches to authentication. Robert started school in British Columbia, was a student at the University of Waterloo, and worked for many years in New Zealand before returning to Canada



▶ DATE  
JANUARY 8, 2013

▶ TIME  
4:30PM TO 6:00PM

▶ VENUE  
CENTRE ROOM - BC HYDRO'S  
EDMONDS OFFICE,  
6911 SOUTHPOINT DRIVE,  
BURNABY, BC

# “Meet and Learn”

Technical Society Reporting Out Session - CEATI/AEIC/CIGRE

## JOINT BC HYDRO/IEEE INDUSTRY APPLICATIONS CHAPTER EVENT

The IEEE Vancouver Section Industry Applications Society Chapter and BC Hydro are pleased to co-sponsor this technical society reporting out event. The purpose of this event is to share and transfer knowledge gained from attending technical society meetings, conferences, etc. with others in the profession. The presentations to be made at this event are from a member of the CIGRE D1-Emerging Test Techniques Committee and a member of the Electric Power Apparatus Committee of the Association of Edison Illuminating Companies (AEIC), plus an attendee of the 2012 CEATI Grounding and Lighting Workshop. All presenters will provide a summary of the topics presented at the events they attended, plus cover any highlights, share any new information learned and discuss issues that are currently of high interest to BC Hydro as well as the rest of the power industry. Each presentation will be 30 minutes long. Please come and meet with colleagues on topics relevant to the power industry. Food and refreshments will be provided. Registration is encouraged and the event is free-of-charge.

### 4.30 - 5.00: “CEATI 2012 Grounding and Lighting Workshop Highlights” by Mazana Armstrong



Mazana Armstrong is an Engineering Team Lead with BC Hydro Transmission Engineering. Her responsibilities include electrical aspects of the transmission line design, operation and maintenance including environmental aspects of transmission lines such as RI, TVI, audible noise; electric and magnetic fields and the related induction and biological effects; tower shielding design; tower grounding; engineering aspects of worker safety; joint use of ROWs and other topics relevant to the design, maintenance and management of BC Hydro's transmission system assets. She holds a degree in Electrical Engineering from the University of Zagreb, Croatia, and M.A.Sc. and Ph.D. from the University of British Columbia, Canada. Mazana is a registered professional engineer in the Province of British Columbia. She is also a paper reviewer for IEEE Transactions on Power Delivery, and she is a member of the Canadian Standards Association (CSA) and the IEEE Standards Association.

Grounding and lightning issues continue to be an important area of development for the industry, as new and better ways to design, construct and test grounding and lightning systems progress to meet higher standards and changing industry demands. The Annual Grounding and Lightning Workshop was held in Vancouver in October 2012 and it brought together leading grounding and lightning experts from around the world, including representatives from electric utilities, consultants,

and equipment manufacturers. This workshop serves as an open forum for information exchange, with a focus on technical presentations, training and the sharing of ideas and experiences for the benefit of the industry. Mazana will provide a summary of the topics presented at the workshop and highlight and discuss issues that are currently of high interest to BC Hydro as well as the rest of the power industry.

### 5.00 - 5.30: “AEIC EPAC - Fall 2012 Meeting - P&C and Telecom” by Bob Stewart



Bob Stewart is a Principal Engineer responsible for the Electrical area at BC Hydro with 31 years of experience in the Transmission, Generation and Distribution areas. He is also BC Hydro's representative on the Electric Power Apparatus Committee of AEIC. He is a Senior IEEE member and is registered as a Professional Engineer in the province of BC.

Bob will report out on his attendance of the fall 2012 Electric Power Apparatus Committee (EPAC) meeting of the Association of Edison Illuminating Companies (AEIC). The theme of this meeting was P&C and Telecom with vendors such as S&C, Schweitzer, ABB and Siemens providing presentations, plus EPRI providing their thoughts on future developments in these areas. There was also a roundtable discussion on Distribution Automation by the EPAC members and presentations on the status of the Reforming the Electric Energy System Curriculum Program in the USA. Bob will share information and observa-

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tions learned from the various vendor presentations, plus other presentations given and committee roundtable discussions.

### 5.30 - 6.00: 2012 CIGRE General Session Highlights of D1 and D1.34” by Sudhakar Cherukupalli



Sudhakar Cherukupalli is a Principal Engineer and Team Lead of the Transmission Cables Design at BC Hydro with 37 years of industrial experience. He worked at Brown Boveri and was involved in 420kV

switchgear design and subsequently worked in the area of SF6 GIS research. He obtained his Ph.D. in Electrical Engineering from the University of British Columbia and worked at Powertech Labs for 10 years before joining the BC Hydro Transmission Engineering in 1999. He has contributed to several IEEE Standards and has over 30 publications. He is also registered as a Professional Engineer in the Province of BC.

Sudhakar will report out on his attendance of the 2012 CIGRE General Session. Sudhakar is the Canadian National Representative on D1-Emerging Test techniques, has been active in several of the CIGRE WGs and serves as a Convener for the CIGRE WG D1.34 - DGA Interpretation of Fluid-Filled Cable Systems. At this meeting he will cover the highlights of the activities in these Working Groups, what kind of information is available and how this work is relevant to BC Hydro and the industry.





# Biomedical Engineering

THE UNIVERSITY OF BRITISH COLUMBIA

## 2012/13 Grand Rounds Seminar Series

**Date:** Wednesday, January 16, 2013

**Time:** 7 - 8 AM

**Location:** Vancouver General Hospital, Diamond Health Care Centre (DHCC) Room 1020, 2775 Laurel Street

**Map:** [https://www.vch.ca/402/7678/?site\\_id=74](https://www.vch.ca/402/7678/?site_id=74)

**Speaker:** Stephen Murphy, MD, Tufts University School of Medicine, Center for Computer Assisted and Reconstructive Surgery, New England Baptist Hospital.

**Title:** "The HipSextant Project: Medical Device Development from Initial Concept to Clinical Implementation"

**Abstract:** The topic of the presentation is intended to improve the young surgeon and engineer's understanding of the process of medical device development. Using the current HipSextant project as a prototype, topics will include developing initial concepts, intellectual property strategy, multidisciplinary collaboration, design, manufacturing, clinical assessment, regulatory approval, and ultimately clinical implementation.

**Speaker's Bio:** Stephen B. Murphy, MD is an orthopedic surgeon at New England Baptist Hospital in Boston who studied engineering at Dartmouth College and spent two years as a research fellow in Orthopedic Biomechanics prior to clinical training. He specializes in joint preserving and reconstructive surgery about the hip, developing surgical techniques, instruments, and devices throughout his career.

**Please RSVP** at <http://bmeg-4-stephenmuphy.eventbrite.com/#> so we know how many to expect! **We encourage you to pass this invitation on to others in your network who might be interested in attending.**

Refreshments (especially coffee!) will be provided before the talk at 6:45 AM.