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David Tse  
UCalifornia at Berkeley

## Information theory of high-throughput shotgun sequencing

Shotgun sequencing is the basic workhorse in modern day biology and medicine. Randomly sampled fragments called reads are extracted from the DNA sequence in order to reconstruct it. In this talk, we explore a basic but yet open question: given a sequencing technology and the statistics of the DNA sequence, what is the minimum number of reads required for reliable reconstruction?

By drawing an analogy between the DNA sequencing problem and the classic communication problem, we formulate this question in terms of an information theoretic notion of sequencing capacity. We characterize the sequencing capacity for both synthetic statistical models and for real genomic data.

**Speaker:** David Tse received the B.A.Sc. degree in systems design engineering from University of Waterloo in 1989, and the M.S. and Ph.D. degrees in electrical engineering from Massachusetts Institute of Technology in 1991 and 1994 respectively. From

1994 to 1995, he was a postdoctoral member of technical staff at A.T. & T. Bell Laboratories.

Since 1995, he has been at the Department of Electrical Engineering and Computer Sciences in the University of California at Berkeley, where he is currently a Professor. He received a 1967 NSERC graduate fellowship from the government of Canada in 1989, a NSF CAREER award in 1998, the Best Paper Awards at the Infocom 1998 and Infocom 2001 conferences, the Erlang Prize in 2000 from the INFORMS Applied Probability Society, the IEEE Communications and Information Theory Society Joint Paper Award in 2001, the Information Theory Society Paper Award in 2003, the 2009 Frederick Emmons Terman Award from the American Society for Engineering Education, and a Gilbreth Lectureship from the National Academy of Engineering in 2012.

He is a coauthor, with Pramod Viswanath, of the text "Fundamentals of Wireless Communication", which has been used in over 60 institutions around the world.

Friday 14 September  
2 :00 pm

Rm 2020 Kaiser Bldg  
2332 Main Mall, UBC

**Distinguished Lecturer**

**Information**  
Joint Communications  
chair Vincent Wong  
vincentw@ece.ubc.ca



Jt. Chapter BT-02/COM-19/IT-12/ITS-38/PHO-36/VT-06



## Saving publicly funded health care: the role of economics

*Opening remarks by Dr. David N. Ostrow,  
President and CEO, Vancouver Coastal Health*

Publicly-funded health care is frequently under attack, and no less so in these times of relative austerity. Yet, perhaps ironically, there are sound economic arguments as to why systems like Medicare should be protected, even expanded, and supplementary 'revenue raisers', like user charges, abolished.

Many of these arguments were developed here in Canada and will be outlined in Dr. Donaldson's talk before he then turns to the unpalatable and unspoken truth still often not recognised in health care - that, despite public funding, we need to recognise and more-explicitly manage scarcity of resources.

Dr. Donaldson will also outline a collaborative research and implementation agenda for scarcity management in health care which, if followed, can only further strengthen the efficiency and fairness of Medicare.

**Speaker:** Dr. Cam Donaldson, the Yunus Chair in

Social Business & Health at Glasgow Caledonian University, is an internationally acclaimed health economist with over 25 years experience in the field. His current research focus is microcredit and other forms of social business as interventions to improve health and well-being.

Dr. Donaldson has held faculty positions in Canada (University of Calgary), Australia (University of Sydney), and the United Kingdom (Universities of Newcastle and Aberdeen). In Newcastle he was the inaugural Health Foundation Chair in Health Economics and Founding Director of the Institute of Health & Society, and in Calgary was appointed as the Svare Chair in Health Economics.

Over the course of his career Dr. Donaldson has published over 200 scientific papers and authored or edited several books on aspects of health economics and public service delivery. In this lecture Dr. Donaldson will draw on the ideas presented in his latest book, 'Credit crunch health care: How economics can save our publicly-funded health services.'

Cam Donaldson  
Glasgow Caledonian U

Friday 14 September  
3:30pm  
Reception to follow  
4:30 – 6:00pm

Paetzold Health  
Education Centre  
1st. floor, Jim Pattison  
Pavilion South  
Vancouver General  
Hospital  
899 West 12th Avenue  
Vancouver BC

RSVP required directly to  
Amisha Shah  
ashah@bme.ubc.ca  
by 31 August 4:00pm.

## INAUGURAL C2E2 LECTURE



**Information**  
Engineering in Medicine  
& Biology chair  
Rob Rohling  
rohlink@ece.ubc.ca

**New senior members for IEEE Vancouver, elevated in July meeting of the A&A Review Panel meeting held on 28 July 2012 in Milwaukee, WI, USA.**

**Fu, Yue  
Ghassemi, Abolfazi**

For a complete list of new senior member elevations please go to:  
[http://www.ieee.org/membership\\_services/membership/senior/new\\_senior\\_members.html](http://www.ieee.org/membership_services/membership/senior/new_senior_members.html) There is an email list for senior member upgrade notifications. If you wish to be sent an email whenever new senior member, you may subscribe to this email list. Details are included in the above web page

# Tour: Verathon® Medical (Canada) Company

Friday 31 August 2012

8:00am to 9:00am

2227 Douglas Road  
Burnaby, B.C.

How to get there:  
The company is 20  
minutes away from  
Skytrain Commercial  
platform 2.

## Information

Engineering in Medicine  
& Biology chair  
Rob Rohling  
rohlink@ece.ubc.ca

The tour includes:

- company overview
- tour of facility, including the R&D and manufacturing site
- presentations
- questions and answers

The tour is kindly given by Mr Reza Yazdi, Director of Research and Development in Verathon

Verathon® Medical (Canada) ULC is the lifeblood of Verathon's GlideScope® video laryngoscope brand. Verathon Canada is continuing to expand its rapidly growing operations. GlideScope video laryngoscopes provide a consistently clear, real-time view of the airway and tube placement, enabling quick intubation.

Registration:

The event is free of charge but requires registration. Registration closes at August 28th and space is limited.

Please Email: [sarak@ieee.org](mailto:sarak@ieee.org) to register.



<http://verathon.com/about-verathon-canada>



IEEE Engineering in  
Medicine and Biology



Dave Michelson

## Haven't seen you around lately - what've you been up to, Dave?

1. I've just been elected to the IEEE ComSoc Board of Governors for a three-year term commencing 1 January 2013. (I've been serving as an appointed member of the Board and Director of Education (and Professional Development) since 1 January 2012. With my election, I become a full voting member.) (I'm gratified to note that I topped the polls in NA Region. Thanks to all of you who supported my candidacy.)
2. I've recently been appointed as founding editor of the IEEE Press Series on Vehicular Technology and as a member of the IEEE Press Editorial Board. I'll be attending my first Editorial Board meeting in NJ in just over two weeks.
3. Of course, I continue to serve IEEE in many other roles, including Member, IEEE VT-S Board of Governors; Chair, IEEE VT-S Propagation Committee, Member, IEEE AP-S Wave Propagation Standards Committee, Member, IEEE History Committee, Chair, IEEE Canada Industry Relations Committee, etc.
4. Starting with the next issue I'll be contributing a regular feature on Industry Innovation to IEEE Canadian Review. Three times per year, we'll give readers a close up look at some of the many organizations and programs that help engineers take new products from conception to market and thereby contribute to a strong Canadian economy. We'll also be highlighting some of the successes that these programs have enabled.



**IEEE Joint Aerospace and  
Electromagnetics Chapter**

## Picnic and outdoor movie

Tuesday 28 August  
5:30 pm

Stanley Park, Ceperly Meadow/2nd Beach  
(in between the water and Stanley Park drive)

Join us in beautiful Stanley Park for a picnic  
and enjoy a movie in fresh air  
Network with your fellow local members while we provide  
the refreshments, snacks and sandwiches  
You are welcome to bring your family and friends

We'll wait for you at the spot starting at 5:30pm  
The movie (Ferris Bueller's Day Off) will start at 8:30pm

This event is free for IEEE GOLD and WIE members  
accompanying guest \$5 and children join free of charge

Bring your blanket or lawn chair and your favorite games



**Information**  
Women In Engineering  
Affinity chair  
Zahra Ahmadian  
zahraa@ece.ubc.ca

## SFU science student and former IEEE student branch chair win top spots in Nokia mobile programming challenge

*SFU students Jonathon Simister and Mohammad Akhlaghi place first and second respectively in Nokia's Ready.Set {Code} Challenge June 15, 2012.*

The competition invited developers to participate in one-day hackathons "to build the coolest, baddest apps for the Windows Phone platform and Nokia Lumia devices"

Both students won in the Top 3 overall category, beating out professional programmers, and their award-winning apps will be available in Nokia's application marketplace.

Science student Jonathon Simister captured first place with his application, MolJot, which allows users to draw in the skeletal structures of organic molecules, and then computes the molar mass and chemical formula. Simister's prize was a \$500 gift card and a Nokia Lumia 900 phone.

Mohammad Akhlaghi, former SFU IEEE Student branch chair, and fourth year Electronics Engineering student won the second place prize for his application, Magic Scale, which lets users calculate their weight and age on each planet in the solar system. Akhlaghi received the phone and a \$250 gift card.

Akhlaghi describes his Magic Scale as not only an application, but also "a gallery of beautiful hand drawn pictures accompanying users in their voyage within the planets." Before the hackathon, Akhlaghi had never programmed for a mobile application, and he created Magic Scale entirely on the day of the competition.



Jonathon Simister



Mohammad Akhlaghi

# Application of phasor measurement unit for power system controlled islanding

Moshref Ali  
Powertech Labs

12:00 Noon - 1:00 pm

Wednesday 19 September

BC Hydro - Edmonds A01  
Sky train Auditorium, Bby

## Information

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

Phasor Measurement Units (PMU) are being installed around the power systems worldwide. PMUs can provide fast and reliable information on the power system status on real time basis. PMU general application areas are real time monitoring, advanced power system protection, and advanced control schemes.

In this presentation the application of PMUs for power system islanding and restoration is examined. The feasibility of PMUs for controlled separation is demonstrated in a realistic power system

**Speaker:** Dr. Moshref joined BBA in 2012 as an executive with over 30 years of power system experience in the energy industry covering power system planning, system operation, asset management, alternative energy resources for power generation, and software development for the analysis of power systems. He was with Powertech Labs Inc. in past 16 years serving as Manager Power System Studies. Dr. Moshref was cofounder of CYME International Inc. and a researcher at Hydro Quebec Research Institute (IREQ). Dr. Moshref is a senior member of the Institute of Electrical and Electronics Engineers (IEEE)

You can attend this meeting online. WebEx is available on a first come first serve basis for attendees to the extent of server limit.

Wednesday 19 September  
11:45 am, PDT (GMT-07:00)

Meeting Number: 808 572 926

Meeting Password: 4PESVancouver

To join the online meeting (now from mobile devices!)

1. Go to <https://powerex.webex.com/powerex/j.php?ED=182298157&UID=0&PW=NODU1NGMxNTIj&RT=MiM0>
2. If requested, enter your name and email address.
3. If a password is required, enter the meeting password: 4PESVancouver
4. Click "Join".

To view in other time zones or languages, please click the link:

<https://powerex.webex.com/powerex/j.php?ED=182298157&UID=0&PW=NODU1NGMxNTIj&ORT=MiM0>

To join the audio conference only (604) 528-1900 or  
BCH Pax: 71900 Conf. ID: 0571 # Code: 034034 #

For assistance

1. Go to <https://powerex.webex.com/powerex/mc>
2. On the left navigation bar, click "Support".

You can also contact

[gordon.dobson-mack@powerex.com](mailto:gordon.dobson-mack@powerex.com)  
1-604-891-6004

The playback of UCF (Universal Communications Format) rich media files requires appropriate players. To view this type of rich media files in the meeting, please check whether you have the players installed on your computer by going to <https://powerex.webex.com/powerex/systemdiagnosis.php>.

