- **Biometric rich gestures: a touching farewell to passwords?**

- **Code instrumentation with non-functional properties**

- **Tour: Ultrasonix Medical Corporation**

- **On the stabilization of positive switched systems**

- **HTML5 WaveGuide Code Camp**

- **Network coding for error correction and security**

- **Wireless NoC as interconnection backbone for multicore**

- **Connected vehicle workshop**

Biometric rich gestures: a touching farewell to passwords?

Nasir Memon
NYU-Poly

Distinguished Lecturer

Friday 06 July
3:30pm - 4:30pm

Room KAIS 2020
Fred Kaiser Building
2332 Main Mall, UBC

Information
Signal Processing chair
Z. Jane Wang
zjanew@ece.ubc.ca

Multi-touch interfaces allow users to have a very intuitive, tactile and visual interaction with a computing device by touching a surface with their fingers with gestures that resemble interaction with real life objects. The development of multi-touch technology opens up avenues for new authentication techniques that go beyond text passwords. In this talk we discuss gesture based authentication alternatives that are both engaging and pleasing to the users while providing strong security.

Speaker: Nasir Memon is a professor in the Department of Computer Science and Engineering and director of the Information Systems and Internet Security (ISIS) laboratory at NYU-Poly and the founding director of the Center for Interdisciplinary Studies in Security and Privacy (CRISSP), a collaborative initiative of multiple schools within NYU including NYU-Steinhardt, NYU-Wagner, NYU-Stern and NYU-Courant. His research interests include digital forensics, data compression, and multimedia computing and security.

Memon earned a Bachelor of Engineering in Chemical Engineering and a Master of Science in Mathematics from Birla Institute of Technology and Science (BITS) in Pilani, India. He received a Master of Science in Computer Science and a PhD in Computer Science from the University of Nebraska.

IEEE Signal Processing Society

Code instrumentation with non-functional properties

Sebastian Fischmeister
University of Waterloo

Tuesday 17 July
4:00 p.m.

KAIS 2020
2332 Main Mall
UBC Vancouver campus

Code instrumentation is a common method for tracing programs. Developers use it to understand and monitor modern systems with millions of lines of code. Unfortunately, current software-based tracing methods concentrate on preserving logical correctness only and are thus inadequate for application areas such as embedded systems, real-time systems, and concurrent software.

This talk presents a new side of code instrumentation; considering non-functional properties. Specifically, the talk discusses two approaches relevant for time-sensitive applications: (1) Time-aware instrumentation preserves timing constraints under instrumentation and (2) time-triggered runtime verification provides sound monitoring while preserving jitter and resource demand bounds. Although the two approaches concentrate on timing aspects, they clearly demonstrate the need for future work on instrumentation mechanisms that preserve non-functional properties.

Speaker: Sebastian Fischmeister is an Assistant Professor in the Department of Electrical and Computer Engineering at the University of Waterloo, Canada. He received his MASc in Computer Science at the Vienna University of Technology, Austria, and his Ph.D. degree at the University of Salzburg, Austria. He was awarded the APART stipend in 2005 and worked as a research associate at the University of Pennsylvania, USA, until 2008.

He performs systems research at the intersection of software technology, distributed systems, and formal methods. His preferred application areas are distributed real-time embedded systems in the domain of automotive systems, avionics, and medical devices. He is now working on the theory and application of state-based schedules for adaptive systems and a monitoring/debugging/tracing framework for time-sensitive systems.

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

Tour: Ultrasonix Medical Corporation

Wednesday 11 July
5:00pm to 6:00pm

#130-4311 Viking Way
Richmond, BC

The tour includes:
- company overview
- tour of facility
- quality assurance in ultrasound and biomedical devices
- clinical practice of ultrasound and biomedical devices

The event is free of charge but requires registration. Registration closes at July 6. Space is limited to 25 people and priority will be given to IEEE EMB members.

I will take the Canada line sky train from Broadway/City Hall station at 4pm, so people can join me there, or meet directly at Ultrasonix.

Please email sarak@ieee.org to register and indicate if you would like to meet at Broadway sky train station.

About Ultrasonix: Ultrasonix develops and manufactures diagnostic ultrasound systems designed to make ultrasound easy to use in many areas of patient care. More than 5000 Ultrasonix systems have been sold worldwide. Founded in 2000, Ultrasonix has grown from 2 employees to 160. Ultrasonix is based in Richmond, BC.

http://www.ultrasonix.com/home

Information
Engineering in Medicine
& Biology vice chair
Sara Khosravi
sarak@ieee.org

IEEE Engineering in Medicine and Biology

On the stabilization of positive switched systems: state of the art and open problems

Maria Elena Valcher
University of Padova

Distinguished Lecturer

Monday 25 June
11am-noon

Electrical & Computer
Engineering
Kaiser 2020
2332 Main Mall
UBC

Sponsored by the joint chapters of IEEE Control Systems, Robotics and Automation, and Systems, Man and Cybernetics socities

A positive switched system (PSS) consists of a family of positive state-space models and a switching law, specifying when and how the switching among the various models takes place. PSS's have been adopted for describing networks employing TCP and other congestion control applications, for modeling consensus and synchronization problems, and, quite recently, for describing the viral mutation dynamics under drug treatment.

As for the broader classes of hybrid and switched systems, stability and stabilizability properties have been the two major issues that attracted the researchers' attention. The most popular approach to the investigation of stabilizability of PSS's is undoubtedly the one based on common Lyapunov functions or multiple Lyapunov functions. In addition to the standard quadratic and polyhedric positive definite functions, one may resort to the broader class of copositive (linear and quadratic) functions, by this meaning Lyapunov functions that take positive values only on the positive orthant. Also, interesting conditions involving convex combinations of the subsystem matrices can be adopted to characterize stabilizability. In the talk we will provide a comprehensive picture of the stabilizability conditions for stability, and we will point out some open problems.

Speaker: Maria Elena Valcher received the Ph.D. Degree in Systems Engineering (1995) from the University of Padova (Italy). Since January 2005 she is Full Professor of Control Theory at the University of Padova.

She is author/co-author of more than 60 papers appeared on international journals, 70 conference papers and 14 book chapters. Her research interests include multidimensional systems theory, polynomial matrix theory, behavior theory, convolutional coding, fault detection and observer design, delay-differential systems, switched systems, positive systems and Boolean Control Networks.

She has been in the Organizing Committees and in the Program Committees of several conferences. She is presently Program Chair of the 51st IEEE Conf. on Decision and Control, CDC 2012, Maui.

She was in the Editorial Board of the IEEE Transactions on Automatic Control (1999-2002), Systems and Control Letters (2004-2010) and she is currently in the Editorial Boards of Automatica (2006-today), Multidimensional Systems and Signal Processing (2004-today), and SIAM J. on Control and Optimization (2012-today).

She was Appointed Member of the CSS BoG (2003); Elected Member of the CSS BoG (2004-2006; 2010-2012); Vice President Member Activities of the CSS (2006-2007); Vice President Conference Activities of the CSS (2008-2010).

She is a member of the 2012 and 2013 Control Systems Award committee and a Distinguished Lecturer of the CSS. She received the 2011 IEEE CSS Distinguished Member Award and she is an IEEE Fellow.

Information
CS/RA/SMC
Joint chapter chair
Ryozo Nagamune
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CSS IEEE Control Systems Society

Robotics & Automation Society

Systems, Man, & Cybernetics Society

HTML5 WaveGuide Code Camp

Monday 09 July

8:30am to 5:00pm

UBC Robson Square

800 Robson Street, Room C150, Vancouver

$50 + tax. Breakfast, lunch and snacks are included.

Wavefront is pleased to present a WaveGuide™ code camp to help developers create incredible, complex HTML5 apps that work flawlessly across multiple cross platforms i.e. smartphone, tablet, notebook, or Smart TV. This is a full day event facilitated by HTML5 experts from the Canadian mobile community.

Topics include

- APIs & Templates to kickstart development
- review of basic principles and features of coding with the HTML5 platform
- mini-lessons on the deeper concepts of HTML5 development

Who should attend?

Mid-level to advanced developers
that are comfortable with Javascript

8:30am-9:00am	Registration and breakfast
9:00am-10:00am	Introduction to HTML5 and examples of Javascript API's
10:00am-12:00pm	Coding, mini lessons and demos
12:00pm-12:30pm	Lunch
12:30pm-4:45pm	Coding, mini lessons and demos
4:45pm-5:00pm	Prize draws

ABOUT WAVEFRONT Wavefront is the national centre of excellence for wireless commercialization accelerating the growth and success of wireless companies in Canada. Wavefront improves speed-to-market and delivery of mobile applications and wireless technologies by providing emerging companies with a suite of Waveguide™ training, mobile industry advisory services, incubator office space, testing resources, and market linkages that facilitate commercial engagement with the mobile network and enterprise ecosystem companies around the world. www.wavefrontac.com

Network coding for error correction and security

Raymond Yeung
Chinese Univ of Hong Kong

Distinguished Lecturer

Friday 20 July
11:00 am

Rm 202, Macleod Building
2356 Main Mall, UBC, Vancouver

In recent years, network coding has generated much interest in information theory, coding theory, networking, wireless communications, cryptography, and computer science. Consider a point-to-point communication network on which a number of information sources are to be multicast to certain sets of destination nodes. The problem is to characterize the maximum possible throughputs. Contrary to one's intuition, network coding theory reveals that it is in general not optimal to regard the information to be multicast as a "fluid" which can simply be routed or replicated. Rather, by employing coding at the nodes, bandwidth can in general be saved.

In this talk, we will give an overview of the effort of our research on network coding and its applications to error correction and information security. In particular, network generalizations of the classical algebraic coding theory will be discussed.

Speaker: Raymond W. Yeung received the BS, MEng and PhD degrees in electrical engineering from Cornell University in 1984, 1985, and 1988, respectively. He was with AT&T Bell Laboratories from 1988 to 1991. He joined CUHK in 1991 and has been with Department of Information Engineering since then, where he is currently a chair professor of the Department and Co-Director of the Institute of Network Coding. He is the author of the books A First Course in Information Theory (Kluwer Academic/ Plenum Publishers, 2002) and Information Theory and Network Coding (Springer 2008), which have been adopted by over 60 institutions around the world.

His research interest is in information theory and network coding. Professor Yeung was a member of the Board of Governors of the IEEE Information Theory Society from 1999 to 2001. He has served on the committees of a number of information theory symposiums and workshops. He was the General Chair of the First Workshop on Network, Coding, and Applications (NetCod 2005), a Technical Co-Chair of the 2006 IEEE International Symposium on Information Theory, a Technical Co-Chair of the 2006 IEEE Information Theory Workshop, Chengdu, and a General Co-Chair of the First Workshop on Network Coding and Data Storage (NCDS 2011). He will be a General Co-Chair of ISIT 2015 to be held in Hong Kong.

He has delivered plenary talks at a few conferences, including 2008 International Symposium on Information Theory and Its Applications (ISITA 2008), 2009 IEEE International Symposium on Information Theory (ISIT 2009), and 2010 IEEE International Conference on Communications (ICC 2010). He has served as an Editor-at-Large of Communications in Information and Systems, an Editor of Foundation and Trends in Communications and Information Theory and of Foundation and Trends in Networking, and an Associate Editor for Shannon Theory of the IEEE Transactions on Information Theory.

He was a recipient of the Croucher Senior Research Fellowship for 2000/01, the Best Paper Award (Communication Theory) of the 2004 International Conference on Communications, Circuits and System, the 2005 IEEE Information Theory Society Paper Award, and the Friedrich Wilhelm Bessel Research Award from the Alexander von Humboldt Foundation in 2007. He is a Fellow of the IEEE and the Hong Kong Institution of Engineers.

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

IEEE COMMUNICATIONS SOCIETY IEEE Information Theory Society **photonics** SOCIETY

BTS IEEE Broadcast Technology Society **VTS** ITSS

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

ED 16JUL12

Wireless NoC as interconnection backbone for multicore chips: promises and challenges

Partha Pande
Washington State Univ

Wednesday 25 July
5:00 pm to 6:00 pm

Room 2020, Kaiser Building, 2332 Main Mall, UBC

Information
Solid-state Ciruits chair
Shahriar Mirabbasi
shahriar@ece.ubc.ca

ED 16JUL12

Current commercial Systems-on-Chips (SoCs) designs integrate an increasingly large number of pre-designed cores and their number is predicted to increase significantly in the near future. For example, molecular-scale computing promises single or even multiple order-of-magnitude improvements in device densities. The Network-on-Chip (NoC) is an enabling technology for integration of large numbers of embedded cores on a single die. The existing method of implementing a NoC with planar metal interconnects is deficient due to high latency and significant power consumption arising out of long multi-hop links used in data exchange. The latency, power consumption and interconnect routing problems of conventional NoCs can be addressed by replacing or augmenting multi-hop wired paths with high-bandwidth single-hop long-range wireless links.

This opens up new opportunities for detailed investigations into the design of wireless NoCs (WiNoCs) with on-chip antennas, suitable transceivers and routers. Moreover, as it is an emerging technology, the on-chip wireless links also need to overcome significant challenges pertaining to reliable integration.

In this talk I will present various challenges and emerging solutions regarding the design of an efficient and reliable WiNoC architecture.

Speaker: Partha Pratim Pande received the M.S. degree in computer science from the National University of Singapore and the Ph.D. degree in electrical and computer engineering from the University of British Columbia, Vancouver, BC, Canada. He is an Associate Professor at the School of Electrical Engineering and Computer Science, Washington State University, Pullman. His current research interests are novel interconnect architectures for multicore chips, on-chip wireless communication networks, and hardware accelerators for biocomputing. He has around 60 publications on this topic in reputed journals and conferences. He is the Guest Editor of a special issue on sustainable and green computing systems for ACM Journal on Emerging Technologies in Computing Systems. Dr. Pande currently serves on the Editorial Board of IEEE Design and Test of Computers and Sustainable Computing: Informatics and Systems (SUSCOM). He also serves in the program committee of many reputed international conferences.

Friday 20 July
8:30 am - 5:00 pm
ANGU 492, Sauder School of Business
2053 Main Mall, UBC, Vancouver

CONNECTED VEHICLE WORKSHOP

For free registration and technical program see:
http://icics.ubc.ca/workshops/vehicle2012/

Information
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