IEEE VANCOUVER CONTACT

WWW.IEEECONTACT.ORG

FEBRUARY 2016
CIRCULATION 3468

VOLUME 47
NUMBER 02

A Message from the Chair

Welcome to a new year of IEEE activities in Vancouver. I am Lee Vishloff, your chair for this year. I look forward to working with our many volunteers who collectively work to provide you with events that help you advance your career.

The backbone of the Vancouver organization is our many Technical Chapters who provide technical lectures and seminars in areas that are current to specific industry areas. Attending these is an easy way to keep your technical view up to date. Attending these events also deepens your ties to others who work in your area. This networking opportunity can prove invaluable when later recruiting or looking for a new job.

Many of you may not be aware of our affinity groups: Young Professionals, Women in Engineering, and the Consultants Network which focus on the professional development side of our careers. Our current leaders in each area are very enthusiastic and actively planning an exciting year for our members. I encourage you to check these groups out if they apply to you.

Last year we made a commitment to increase our student scholarship endowment as our awards are to the small end. The Vancouver Section has increased its number of student branches and we expect further growth in this area this year. In order to add to our endowment fund, which is managed by the IEEE Canada Foundation, we have launched an initiative to direct any conference surpluses we have towards this fund. In alignment with this objective we have increased our involvement with IEEE conferences. This year we are hosting the Canadian Conference on Electrical and Computer Engineering (CCECE). Many of the executive are actively engaged in organizing this event for May. Stay tuned for more news.

The IEEE Technical Societies run a huge number of conferences and events globally each year (1500). For 2016 there are currently six IEEE conferences planned for Vancouver and we expect to announce one more shortly.

- 2016 IEEE World Congress on Computational Intelligence (WCCI2016)
- IEEE 7th International Symposium on Power Electronics for Distributed Generation Systems (PEDG)
- 2016 14th IEEE International New Circuits and Systems Conference (NEWCAS)
- 2016 IEEE International Conference on Cybercrime and Computer Forensic (ICCCF)
- 2016 IEEE Canadian Conference on Electrical and Computer Engineering (CCECE)
- 2016 IEEE International Symposium on Ethics in Engineering, Science and Technology (ETHICS)

Try to attend one of these in your technical area. Your company will save a lot of money over sending you away for training. In our rapidly changing industry staying current is an important part of career planning.

I hope to see you at one of our events. If you have ideas and suggestions, please send a note to Lee.Vishloff@IEEE.org. I hope you have a successful 2016.

Best regards, Lee Vishloff, P.Eng

Mukesh Nagpal
BC Hydro

Distinguished Lecturer

Wednesday 24 February

12:00PM to 1:00 PM

BC Hydro
Edmonds Auditorium
6911 Southpoint Dr, Bby

Experience of severe overvoltage in an interconnected transmission subnetwork during single-phase open period

A single-phase trip and automatic reclose scheme applied to a long transmission circuit, interconnecting the utility grid to a remote subnetwork containing generation and loads, improves the interconnection reliability. However, the entire remote subnetwork loses supply in one phase during a single-phase open condition should the generation be out of service in the subnetwork. Under this condition an excessive overvoltage was observed on the open phase in a remote 287 kV subnetwork to the BC Hydro system.

This presentation will share the lessons learned from this incident and the countermeasures taken to prevent reoccurrence of such overvoltages. Digital disturbance records will be used to explain the sequence of events, from initiation of the incident to the eventual tripping of an overexcited transformer that terminated the system overvoltage. Though it was not specifically designed to do so, the transformer differential protection operated and thereby prevented damage to surge arresters. The presentation will use a simple graphical method to explain how differential protection response would change as the system voltage increases from a high to a severe level of overvoltage. A simplified steady-state symmetrical component analysis will give a physical insight into the series resonance phenomenon leading to overvoltage on the open phase. Before presenting conclusions, the mitigation applied in the subnetwork to avoid the reoccurrence of hazardous overvoltage in the future will be discussed.

Speaker: Mukesh Nagpal is a Senior Member and distinguished lecturer of IEEE Power and Energy Society, Adjunct Professor at University of British Columbia, Vancouver, BC and a Professional Engineer in the Province of British Columbia. He received the Ph.D. and M.Sc. degrees in electrical engineering from the University of Saskatchewan, Saskatoon, SK, Canada. Currently, he is a Principal Engineer/ Manager with the Protection and Control Planning Group within BC Hydro Engineering, Burnaby. He has more than 28 years of experience in electrical consulting, utility research, and power system protection. Dr. Nagpal has written about 50 technical papers on power system relaying and contributed to several ANSI/IEEE sponsored standards or guides on relaying practices

Information
Joint Power & Energy Chair
Rama Vinnakota
Rama.Vinnakota@bchydro.com

IEEE PES Power & Energy Society®

DEIS

International conference on cybercrime and computer forensics (ICCCF)

Simon Fraser University Harbour Centre — 12-14 June

The conference is technically co-sponsored by IEEE Vancouver and is being co-hosted by Simon Fraser University's School of Criminology and the Asia Pacific Association of Technology and Society (APATAS). Please note that the call for papers closes on February 1, 2016. Qualified papers will be considered for indexing and publication in the IEEE's Xplore Digital Library. The conference will also have a poster session, and several student panels where students will be invited to present papers on "open" topics related to cybercrime and computer forensics. Any graduate students who are interested in enrolling in the conference and presenting a paper at one of the student panels will be able to enrol and participate in all of the conference activities at a 60% discount from the usual conference price.

For further information on the conference, and/or to register or submit a paper, please visit the official conference website at:
http://www.apatas.org/icccf/icccf-2016/

Lindsay LeBlanc
University of Alberta

Exploring quantum mechanics in many-particle systems using ultracold quantum gases

At temperatures around one billionth of a degree above absolute zero, ultracold quantum gases offer an unprecedented opportunity for exploring the behaviour of many-body systems using precise control over the atoms' temperature, interactions, potential energy landscapes, and internal quantum degrees of freedom. In our quantum simulation experiments, we use ultracold gases of rubidium and potassium atoms to study analogies to condensed matter phenomena.

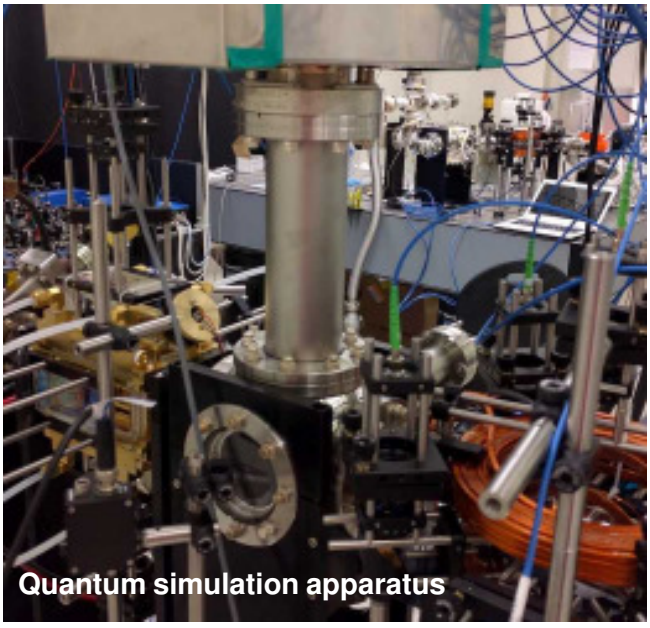
One particular interest in these experiments is to combine laser techniques that mimic "spin-orbit coupling" (where the spin and the motion of the atoms are correlated) with techniques that tune the interparticle interactions. Here, it is predicted that competition between magnetic-like and superfluid-like many-body orders should exist; we plan to explore the nature of this many-body collectivity and its dynamics.

In a second set of experiments, we are developing hybridized ultracold quantum gases with nanoscale optical and mechanical devices to exploit the best features of each — long coherence times of atoms, and integrability of solid state devices with conventional computational architectures. Through all of these experiments, an overarching question lingers: how do many-particle systems exhibit quantum effects, and how can we exploit these phenomena on ever large scales?

Monday 01 February

2:30 PM to 4:00 PM

UNBC
Prince George Campus,
Room 5-174



Quantum simulation apparatus

Speaker: Lindsay Jane LeBlanc currently holds the following positions

- 2013 - present Assistant Professor Department of Physics, University of Alberta, Edmonton AB, Canada
- 2014 - present Canada Research Chair for Quantum Simulation with Ultracold Quantum Gases Tier II
- 2014 - present Strategic Chair (Tier 3) in Hybrid Quantum Systems Alberta Innovates { Technology Futures
- 2015 - present Fellow, Canadian Institute for Advanced Research Quantum Materials Programme

The curriculum vitæ for Lindsay LeBlanc is available online at http://www.ualberta.ca/~ljleblan/curriculumvitaeweb.pdf

Plus two more confirmed February talks at Prince George Campus Room 5-174

LIDAR for physical geography

Speaker: Rob Vogt, UNBC
Monday 15 February
2:30 PM

Biomedical applications of near-infrared spectroscopy

Speaker: Tim Schwaab, UNBC
Monday 22 February
2:30 PM

Information
Matt Reid
IEEE UNBC Chair
mreid@unbc.ca

UNBC UNIVERSITY OF NORTHERN BRITISH COLUMBIA

How to overcome the capacity crunch - new challenges in optical networks

Krzysztof Walkowiak
Wroclaw University

Thursday 04 February

1:30 pm - 2:30 pm

IRMACS Centre
ASB 10940
Simon Fraser University

IEEE CIRCUITS AND SYSTEMS SOCIETY
IEEE VANCOUVER/VICTORIA JOINT CHAPTER

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

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

In the last few years, many new network services have gained much popularity. The most significant examples are cloud computing and content-oriented networking. In more details, the cloud computing has recently evolved from an emerging technology to an recognized networking approach that is gaining extensive acceptance and deployment. According to "Cisco Global Cloud Index" report, the global cloud IP traffic will increase nearly 4-fold from 2013 to 2018 with a CAGR (Compounded Annual Growth Rate) of 32%. Moreover, by 2018 78% of all workloads processed in data centers will be executed in the cloud. In addition, the content-oriented networking approach has been proposed few years ago to facilitate the distribution of various content over the Internet. Cisco in "Cisco Visual Networking Index" report predicts that Content Delivery Networks (CDNs) will carry over 62% of Internet traffic in 2019 compared to 39% in 2014. Both cloud computing and content-oriented services significantly contribute to the overall Internet traffic. Moreover, other bandwidth-hungry applications and services like Internet of Things, Big Data, 5G, are forecasted to additionally increase the number of devices connected to the Internet as well as boost the demand for network bandwidth. Therefore, to overcome the possible future capacity crunch, new network technologies are required with a special focus on optical networks that are implemented in backbone networks.

Currently, the most popular optical approach is a Wavelength Switched Optical Network (WSON) implemented with the Wavelength Division Multiplexing (WDM) technology, which operates within rigid/fixed frequency grids and with singleâ••lineâ••rate (SLR) transponders making use of single-carrier modulation techniques. However, during the past couple of years, the research in optical networking has experienced significant developments mostly focused on the idea of Elastic Optical Networks (EONs). The main innovation of EON with respect to conventional WSON is the provisioning of sub-wavelength granularity for low-rate transmission and super-channel connectivity for accommodating ultra-high capacity client signals within a common network. The EONs allow to allocate flexibly appropriate-sized optical bandwidth, by means of contiguous concatenation of optical spectrum, to an end-to-end lightpath and according to traffic demand. Moreover, EONs enable the application of advanced and spectrallyâ••efficient modulation formats. As a consequence, the EONs utilize network resources more efficiently and, at the same time, they provide network connectivity adaptively and according to bandwidth demands.

However, due to the predicted traffic growth in the time perspective of 10-20 years, some new advances in optical networks will be required. Space-Division Multiplexing (SDM) technology seems to be an attractive candidate for future optical networks. The main idea behind SDM is to exploit the spatial dimension to provide a significant increase in the transmission system capacity. The simplest version of SDM assumes a use of fiber-bundles composed of physically-independent, single-mode fibers. More advanced SDM deployments will be based on multicore fibers (MCF) or multimode fibers (MMF).

The talk will concentrate on the evolution of optical networks and various aspects related to optimization of optical networks. First, the most popular network services will be briefly discussed together with predictions on network traffic. Next, the general idea of Elastic Optical Networks and Space-Division Multiplexing technology will be presented. The main part of the talk will be focused on optimization of EONs in the context of traffic patterns following from cloud computing and content-oriented networking. In more details, various approaches for optimization of EONs will be discussed including ILP (Integer Linear Programming) modeling, heuristic and metaheuristic algorithms. Some illustrating results obtained on real topologies will be reported to show performance of various optimization methods in the context of EONs and to compare EONs against classical WDM networks. Finally, new research challenges that arise in the context of SDM networks will be highlighted.

Speaker: Krzysztof Walkowiak received the Ph.D. degree and the D.Sc. (habilitation) degree in computer science from the Wroclaw University of Technology, Poland, in 2000 and 2008, respectively. Currently, he is an Associate Professor at the Department of Systems and Computer Networks, Faculty of Electronics, Wroclaw University of Technology. His research interest is mainly focused on modeling and optimization of communication networks including: elastic optical networks, overlay network, content-oriented networks, survivable networks, distributed computing systems. Prof. Walkowiak has been involved in many research projects related to optimization of communication networks. He received The 2014 Fabio Neri Best Paper Award, Best Paper Award in the 7th International Workshop on Design of Reliable Communication Networks (DRCN 2009), Best Paper Award in the 7th International Workshop on Reliable Networks Design and Modeling (RNDM 2015). Moreover, he has been consulting ICT projects for large companies including Ernst and Young, Skanska, TP SA, PZU, PKO BP, Energia Pro, BNP Paribas. Prof. Walkowiak published more than 200 scientific papers including the best journals in the field of optimization and modeling of communication networks. He is an Associate Editor of the Journal of Network and Systems Management and he serves as a reviewer for many international journals and conferences. Prof. Walkowiak is a senior member of IEEE and ComSoc. Web page: http://www.kssk.pwr.edu.pl/walkowiak/?lang=en

David Simpson
Consultant

Networking 101 –
What you need to know to excel at networking!

Ever wish you were better at networking, either at work or in social settings? You can be, and it only takes an hour. Join us for a humorous and enlightening look at the basics of networking.

You'll learn:

- Why do we network?
- The three types of people at networking events
- How to select the right events
- Why setting the right intention for the event is critical
- How to craft a message that helps identify networking targets
- How to use questions to build relationships
- When and how to politely exit a discussion
- There will be time for practising the skills and process models you will be learning.

Speaker: David Simpson was born and raised in Vancouver, David left to go east to McGill, and stayed in Ontario after graduating until returning to BC in 2004. He worked in Manufacturing for Procter & Gamble, is technical sales support at Westinghouse Canada, and in sales at IBM, where he was promoted twice within a 4 year period. His last 2.5 years at IBM were spent as part of the global team covering the Toyota account, where he remains as the only ever non-Japanese team member, due to his understanding of both how the vehicles are made and distributed and how people are developed.

Using the knowledge learned from IBM and Toyota, David joined The Original Cakerie, where the President challenged him to maximize production at a facility which he believed to be at 80% of capacity, but, in spite of having run operations for 5 years himself, the President did not know how to achieve full capacity. David led the Operations team to increase daily production by 57% over 3 years.

David has been consulting on Lean manufacturing since 2009, and developed the Lean Six Sigma Certificate Program for BCIT, teaching the 2 Lean Manufacturing classes for the first 6 terms. He is the creator of the "From Educated to Enlightened" Leadership Training system and can be reached via his web site at www.DavidSimpson360.com, or on various social media using the user name DavidSimpson360.

Thursday ~~18~~ 11 February

6:00pm to 8:00pm

Room 810
BCIT Downtown Campus
555 Seymour St
Vancouver

Information
Sean Garrity
IEEE youngprofessionals
sean.garrity.ca@ieee.org

REGISTRATION
https://meetings.vtools.ieee.org/m/37774
http://www.eventbrite.com/e/networking-101-what-you-need-to-know-to-excel-at-networking-tickets-20596568892?aff=Contact

IEEE youngprofessionals

28JAN16

The IEEE Young Professionals affinity group of IEEE Vancouver

Toru Namerikawa
Keio University, Japan

Consensus and MPC-based formation control for a multi-UAV system

In this talk, a cooperative formation control strategy with collision-avoidance capability for a multi-unmanned aerial vehicle (UAV) system using decentralized model predictive control (MPC) and consensus-based control is dealt with. Consensus-based control algorithms are applied for formation flying in three-dimensional space. However, UAVs where these formation control algorithms are applied have not the ability to avoid collisions. Decentralized model predictive control (MPC) is applied to generate control inputs for formation flying with collision-avoidance capability. Using decentralized MPC, each UAV plans only its own action to track the trajectory specified by the formation control algorithm within the feasible regions satisfying collision-avoidance. We show how the optimization problems with coupled constraints such as collision-avoidance can be solved by each decoupled UAV in parallel with the other UAVs so that the decisions independently taken by each UAV can ensure consistency in coupled constraints of collision-avoidance. The computation time is also taken into account because it is a crucial factor to apply MPC to actual UAVs. Finally, the proposed approach is validated by some simulations.

Speaker: Toru Namerikawa received the B.E., M.E and Ph. D of Engineering degrees in Electrical and Computer Engineering from Kanazawa University, Japan, in 1991, 1993 and 1997, respectively. He is currently a Professor at Department of System Design Engineering, Keio University, Yokohama, Japan. He held visiting positions at Swiss Federal Institute of Technology in Zurich in 1998, University of California, Santa Barbara in 2001, University of Stuttgart in 2008 and Lund University in 2010. His main research interests are robust control, distributed and cooperative control and their application to power network and mechatronic systems.

Tuesday 16 February

11am - noon

Kaiser 2020
2332 Main Mall, UBC

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

Information
CS/RA/SMC
Joint chapter Chair
Ryozo Nagamune
nagamune@mech.ubc.ca

IEEE Okanagan College Student Branch
and
IEEE Okanagan Subsection
Presents

Valentin Koch, Principal Research Engineer, Autodesk, Inc.

Rotations in 3D Graphics Programming and the Gimbal Lock

Time & Date: **6:30 pm on January 27, 2016**

Location: **Okanagan College Room E 310**

Talk Abstract:

Rotations are fundamental in 3D computer programs, such as video games, 3D modelling, and embedded navigation systems. A frequent mistake in 3D graphics programming is to use the so-called Euler angles, or Euler matrices, to rotate objects around the traditional X, Y, and Z-axis. In this talk, Valentin will show why using Euler angles can lead to situations where an object loses one degree of freedom. The problem is referred to as the "Gimbal Lock". With some mathematical examples, Valentin will show why Gimbal Lock occurs and will present different techniques to perform rotations in 3D that avoid the issue. This talk is for people who are interested in 3D graphics programming and have a basic understanding of Linear Algebra and matrix computations.

Speaker Biography:

Valentin Koch joined Autodesk, Inc., in 2010 to help create the new road and highway optimization service. He is the product owner of the InfraWorks 360 optimization services, and he is architect of the optimization algorithms. Valentin previously worked as a consultant in operations research and optimization. He holds an MSc in mathematics and a BSc in mathematics and computer science. Valentin has published several articles in peer-reviewed journals about subjects that are related to optimization and operations research, including applications in road design optimization and resource allocations for road construction.

Refreshments will be provided. For further information please contact:
Youry Khmelevsky (email: youry@ieee.org)

IEEE Okanagan College Student Branch
and
IEEE Okanagan Subsection
Presents

Bryan Gardiner, former Googler

There and Back Again: Life at Google

Time & Date: **5:30 pm on January 27, 2016**

Location: **Okanagan College Room E103**

Talk Abstract:

Named Fortune's #1 best company to work for, for six years, Google's culture is imbued with moonshot thinking, creativity, and a sense of humour, and Googlers tackle problems at unprecedented scale. To balance a fast-paced work environment, there are many perks and opportunities for growth, both work-related and otherwise. In this talk Bryan will share highlights and lowlights, lessons and surprises on a tour through his three years as a freshly graduated software developer, working in Search and Ads at Google Seattle.

Speaker Biography:

Bryan Gardiner grew up in the Okanagan and has been involved with computers for as long as he can remember. He studied at Okanagan College and UBC Okanagan and graduated in 2011 with an Honours in Computer Science and a Major in Mathematics, and performed research in computational convex analysis. He then spent a few memorable years with Google in Seattle. He also develops free software in his spare time.

Refreshments will be provided. For further information please contact:
Youry Khmelevsky (email: youry@ieee.org)

Save the date!!

Thursday 24 March

18:00 to 21:00

Please join us for

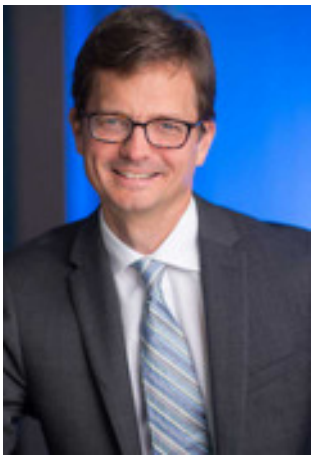
IEEE Vancouver 2016 Annual General Meeting

We have an exciting evening planned for our members and friends with delicious food, an outstanding keynote speaker and the opportunity to network with your friends and colleagues at the great venue of the Hilton Metrotown in Burnaby.

Importance of infrastructure investment

by keynote speaker

Chris O'Riley — Deputy CEO BC Hydro



Since starting with BC Hydro in 1990, Chris has worked throughout the organization including Capital Projects, Generation, Customer Care, Powerex and Corporate Risk. In addition to his corporate role as Deputy CEO, Chris leads the delivery of capital infrastructure projects for BC Hydro.

Chris is a Professional Engineer and holds a Master's degree in Business Administration. He is a board member of Powertech and Science World, and is a board advisor to Yukon Energy Corporation. Chris lives in Vancouver with his wife and three children, where he is active in his local community.

Watch IEEE Contact for further details

Rama Vinnakota, Vice-Chair
Vancouver IEEE Section
rama.vinnakota@gmail.com

IEEE Vancouver Scholarship Awards

Invitation for student applications

IEEE Vancouver will award up to three scholarships to students enrolled in engineering related programs who best meet the objectives of the scholastic trust fund. Each scholarship will consist of a $500 cash award. Successful applicants will be invited to receive their award at the IEEE Vancouver Annual General Meeting on Thursday 24 March 2016.

Students at BCIT, SFU, UBC/Vancouver, UBC/Okanagan, Okanagan College, Kwantlen University and UNBC are within the geographic areas of the Vancouver section and are eligible for these scholarships. Students studying Electrical and Computer Engineering, Computer Science or related disciplines are encouraged to apply. Awards are not restricted to IEEE student members, but such members will receive preferential consideration. A single application will be considered for all three awards, - separate applications are not required. The deadline for submission of applications is March 1, 2016. If you have any questions, please contact your IEEE student branch councillor.

Application requirements

Applicants should write a letter of application containing their name, phone number, e-mail address, postal address, student status (grad or undergrad), IEEE Membership status and membership number.

Two references (name, academic and/or IEEE membership status, phone number, and e-mail address) who can each confirm the information provided in the application. Suggested references are: university teaching staff; any grade IEEE members; student activities references; present or former employers.

The application letter explains why the student meets the objectives of the scholarship program, particularly with reference to their participation in student activities and electrical engineering activities. This letter should be no more than one page long.

Evidence of academic achievement. A copy of the student transcript will provide sufficient evidence.

Objectives and specific intent of each award

Hector J. MacLeod Scholarship Award

IEEE Vancouver offers this scholarship in honour of Dr. H. J. MacLeod, Dean Emeritus, Faculty of Applied Science, University of British Columbia, recognizing his pioneering efforts in education and science. The award will be made to a continuing undergraduate or graduate student in Electrical Engineering (or other electrical/ electronics engineering related programs), who has attained high scholastic honours, demonstrated initiative in the chosen field, and has shown interest in student affairs, particularly in a Student Branch of the IEEE under the geographic area of responsibility of the Vancouver Section.

Thurb Cushing Scholarship Award

IEEE Vancouver, in memory of deceased outstanding individuals of the Section, offers this award to students formally enrolled in electrical and/or electronics engineering related studies who have demonstrated high scholastic attainment and have shown an interest in student affairs.

John Deane Scholarship Award

IEEE Vancouver offers a scholarship in honour of Senior Life Member John Deane, recognizing his active involvement in the IEEE since joining as a UBC student in 1932 through to his semi-retirement in the Vancouver Area since 1976. The award will be made to a student formally enrolled in electrical and/or electronics studies who has attained high scholastic honours and demonstrated initiative in the chosen field. Since this award honours active involvement in the IEEE, a major criteria of this award is involvement in extra-curricular student affairs, especially involvement in a Student Branch of the IEEE under the geographic area of responsibility of the Vancouver Section.