GLOBAL COMMUNICATIONS NEWSLETTER

A Busy 2015 for IEEE ComSoc in Eastern Canada

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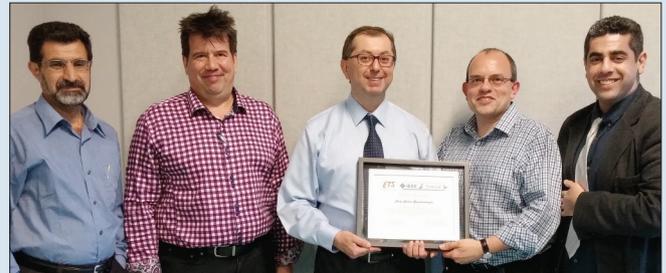
In 2015, IEEE ComSoc Chapters in Eastern Canada had an active and dynamic year. We brought some of the best technical speakers across the world from Australia, Asia, Europe, and North America, to IEEE members that are interested in telecom-related technologies and research. Overall, we had the pleasure of inviting 15 outstanding telecommunication experts from government, academia and industry. The speakers are leaders in the field, and a number of them are IEEE Fellows.

The IEEE Montréal Section was a champion in initiating many of these events. Then, based on the availability and interest of the invited speakers, we coordinated visits to IEEE Sections and research institutes in neighboring cities. Indeed, one of the advantages of IEEE Sections and ComSoc Chapters in Eastern Canada is the close cooperation among volunteers. Specifically, the IEEE Sections in Montréal, Ottawa, Kingston, Québec City, and St-Maurice demonstrated an example of teamwork in adequately managing these technical events.

Logistically, we had exceptional speakers that were invited as IEEE ComSoc Distinguished Lecturers (DL). With this privilege, ComSoc covers airfare expenses for these high-profile speakers. Local expenses were naturally covered by the particular Section and Chapter. Of course, aiming for a Distinguished Lecturer Tour (DLT) to a certain city and its neighboring IEEE Sections is more impactful while remaining economical to the Society. We are proud to report that this is exactly what we achieved in Eastern Canada during 2015. In addition to DL/DLTs, we also had speakers who were invited through sponsorship via the IEEE ComSoc Distinguished Speaker Program (DSP). This program has a fixed financial support that is practical for local expenses and generally excludes travel costs. Yet, even for DSP lecturers, we were able to organize tours to nearby cities. Furthermore, we had speakers who were in the region under research visits. Through networking relations, we were privileged to have them visit

Left to right (Jun. 2015): Dr. Anader Benyamin-Seeyar (Concordia U.), Dr. François Gagnon (ÉTS), Dr. Halim Yanikomeroglu (Carleton U., IEEE ComSoc DL & VTS DL), Dr. Fabrice Labeau (McGill U., IEEE Montréal Section Chair & IEEE Vehicular Technology Society President) and Dr. Mouhamed Abdulla (U. Québec).

Left to right (Jan. 2015): Dr. Mouhamed Abdulla (U. Québec), Dr. Fabrice Labeau (McGill U.), Dr. Reza Soleymani (Concordia U.), Dr. Abbas Jamlipour (U. Sydney, IEEE ComSoc DSP and VTS DL) and Dr. Anader Benyamin-Seeyar (Concordia U.).

our Sections and present their most recent findings to IEEE Members in Canada. Some memorable pictures from throughout the year with DL/DLT/DSP speakers are included with this article.

As expected, despite the different angles of research, the common theme among the majority of these technical seminars focused on the definition, expectation, and the eventual realization of the much anticipated 5G wireless network. Of course, the subject matter of optical communications was also treated. An overview of the seminars is listed below:

IEEE ComSoc Distinguished Lecturer Tours (DL/DLT):
•Prof. Koichi Asatani (Nankai U., China and Japan), "Trends and Issues of FTTH and G-PON," Feb. 18, 2015 (https://meetings.vtools.ieee.org/m/31847).
•Prof. Ekram Hossain (U. Manitoba, Canada), "Self-Organizing Small Cell Networks," Mar. 31, 2015 (https://meetings.vtools.ieee.org/m/31201).
•Prof. Halim Yanikomeroglu (Carleton U., Canada), "Emerging Concepts and Technologies towards 5G+ Wireless Networks," Jun. 03, 2015 (https://meetings.vtools.ieee.org/m/34802).

IEEE ComSoc Distinguished Speaker Tours (DSP):
•Prof. Abbas Jamlipour (U. Sydney, Australia), "Software Defined Networking for Future Dense Wireless Communications," Jan. 07, 2015 (https://meetings.vtools.ieee.org/m/31091).
•Mr. Fawzi Behmann (TelNet Consulting, USA), "The Future of Col-

Left to right (Dec. 2015): Some attendees along with Dr. Mouhamed Abdulla (Chalmers U. Technology), Mr. Fawzi Behmann (TelNet, IEEE ComSoc DSP), Dr. Anader Benyamin-Seeyar (Concordia U.), Mr. Baris Demir (National Research Council of Canada) and Mr. Christopher Faust (research consultant).

Professional Development and Networking through the IEEE DL Program and Workshops in New Zealand

By Nurul I Sarkar, IEEE Joint NZ North, South and Central ComSoc Chair

In New Zealand (NZ), we have a Communications Society (ComSoc) Chapter that is a joint chapter of the IEEE NZ North, South, and Central Sections. We believe that both ComSoc members and the wider community would benefit from a single joint Chapter. However, last year (2015) was very productive for us in the areas of professional activities and community development programs.

Being a ComSoc chapter chair, Associate Professor Nurul I Sarkar had nominated Professor Ying-Dar Lin (National Chiao Tung University, Hsinchu, Taiwan), for an IEEE ComSoc Distinguished Lecturer (DL) tour to NZ. Professor Lin gave three public lectures in three main cities of NZ, Christchurch, Wellington, and Auckland, on 17, 20, 25 August, respectively. All three lectures went very well as far as professional development of the members of the society and the wider community is concerned. A brief description of each of the talks is highlighted below.

Professor Lin gave his first DL talk, "Software Defined Networking: The 2nd Wave of Cloud Computing," at the University of Canterbury, Christchurch on Monday, 17 August. This talk was organized by Professor Harsha Sirisena. Next, Professor Lin gave his lecture "Research Roadmap Driven by Network Benchmarking Lab" in Wellington on Thursday, 20 August. This talk was organized by Dr. Terence Betlehem. The third lecture was held in Auckland on Tuesday, 25 August (see below for more details). The DL talks on some aspects of "Software Defined Networking" are relevant because the NZ Government is encouraging academia-industry collaboration. Most hi-tech companies are small to medium enterprises in NZ; therefore, government initiative and seed funding are important incentives to foster such cooperation.

IEEE DL-NSRG Workshop

In Auckland, the DL lecture was held at the Auckland University of Technology (AUT), Auckland CBD. AUT's School of Computer and Mathematical Sciences hosted a day-long Network and Security Research Group (NSRG) workshop in conjunction with the IEEE DL program on Tuesday 25 August 2015.

Associate Professor Jairo Gutierrez (Head of Computer Sciences) gave an opening talk and outlined the program for the day. The workshop had three keynote speakers: Professor Ying-Dar Lin (ComSoc DL from National Chiao Tung University, Taiwan), Professor Adnan Al-Anbuky (School of Engineering), and Dr. Alastair Nisbet (School of Computer and Mathematical Sciences). In addition to the keynote session,

Professor Adnan Al-Anbuky addressing his keynote speech.

A/Prof. Nurul Sarkar introduces Dr. Nisbet for his keynote talk.

two regular sessions were chaired by Dr. Sayan Ray (Manukau Institute of Technology) and Dr. Bobby Yang (AUT).

In addition, there was a series of presentations given by DLs, invited speakers, and research students. First, Professor Lin gave his DL talk, "Research Roadmap Benchmarking Lab: Deep Packet Inspection, Traffic Forensics, WLAN/LTE, Embedded Benchmarking, SDN, and Beyond". The talk focused on aspects of research activities, including product development and testing, third-party testbed, network benchmarking lab (www.nbl.org.tw), and a research roadmap for traffic forensics, WLAN/LTE, embedded benchmarking, and SDN at the research plane. Some issues and open research areas were discussed.

Professor Al-Anbuky gave his keynote, "Federated Physical Sensor Clouds and Related Cloud Services," which focused on aspects of the management of physical sensor clouds through the remote cloud computing environment, and research activities at the Sensor Network and Smart Environment lab (http://sense.aut.ac.nz/SeNSe_Lab/). Finally, Dr. Alastair Nisbet gave his keynote talk on "Challenges of Implementing Security in MANETs," which focused on issues and challenges of implementing security mechanisms in MANETs. The tutorial style presentations helped the audiences understand the technical subjects very well. There was ample opportunity for question and answer and further discussion after the each keynote talk.

Among the other 11 presenters, Shariful Islam (research assistant) talked about "Base Station Congestion Management for Post-Disaster Scenarios". The remaining 10 Ph.D. students from NSRG gave mini presentations during the day. Despite the busy time of year, approximately 40 people from both within and outside the University attended the event. Having ample opportunity for discussion, people enjoyed networking during lunch breaks. The event was co-sponsored by IEEE and AUT. The organizing chair A/Professor Nurul Sarkar received positive feedback from the participants, indicating that the event was successful.

2015 IEEE NZ Wireless workshop participants.

2015 IEEE DL-NSRG workshop attendees in Auckland.

Dr. Chiaraviglio Gives Invited Talk

Dr. Luca Chiaraviglio (University of Rome Sapienza, Italy) visited Auckland and gave an invited talk at Auckland University of Technology (School of Computer and Mathematical Sciences)) on Thursday, 13 August, 2015. The talk, entitled "From Energy-Aware Networking to

Highlights from RNDM 2015: The 7th International Workshop on Reliable Networks Design and Modeling

By Jacek Rak, Poland; Carmen Mas Machuca, Germany; Eiji Oki, Japan; Dimitri Papadimitriou, Belgium; and Krzysztof Walkowiak, Poland

Left to right: Prof. Jacek Rak (RNDM 2015 General Chair), Prof. Mario Gerla, Prof. Jozef Wozniak, and Prof. James P.G. Sterbenz (RNDM Steering Committee member).

Dr. Roland Wessaely (left) and Prof. Bjarne Helvik (middle) delivering their keynote talks, and Dr. Carmen Mas Machuca (right), Co-chair of RNDM 2015.

Presentation of the Best Paper Award (left to right: Prof. Jacek Rak, RNDM 2015 General Chair and Prof. Krzysztof Walkowiak, recipient of the award for a joint paper with Róza Goscien).

The 7th edition of RNDM (International Workshop on Reliable Networks Design and Modeling) was held in Munich, Germany in Novotel Munich City on 5–7 October, 2015. The event was technically co-sponsored by the IEEE Communications Society and endorsed by its Technical Committees on Computer Communications (TCCC), Communications Systems Integration and Modeling (CSIM), and Communications Quality and Reliability (CQR). Other technical co-sponsors of RNDM 2015 included the IEEE Germany Section, IFIP TC6, and the V.A. Trapeznikov Institute of Control Sciences of RAS.

RNDM 2015 was organized by Gdansk University of Technology, PL, Technical University of Munich, DE, and the University of Electro-Communications, Tokyo, JP, in conjunction with two other meetings: WMNC 2015 (8th IFIP Wireless and Mobile Networking Conference) and Nets-4Cars 2015 Fall (9th International Workshop on Communication Technologies for Vehicles).

RNDM 2015 also offered two co-located half-day workshops, the 2nd International Workshop on Survivable Content-Oriented and Cloud-Ready Networking (S2CN), and the 3rd International Workshop on Understanding the Inter-play between Sustainability, Resilience, and Robustness in Networks (USRR).

The aim of the S2CN workshop was to bring together researchers and to provide an international forum for sharing, exchange, presentation, and discussion of original research results related to survivability aspects of content-oriented networks and cloud computing services. S2CN 2015 was supported by ENGINE, the European research center of Network intelliGence for INnovation Enhancement, the European Commission under the 7th Framework Programme, Coordination and Support Action, Grant Agreement Number 316097 (http://engine.pwr.edu.pl/).

The main purpose of the third edition of the USRR workshop (Understanding the Inter-play between Sustainability, Resilience, and Robustness in Networks) was to introduce rigorous methods for science-based communication networks and systems design which capture all sources of uncertainty and its propagation (including probabilistic approaches) to determine probable outputs when specific factors are unknown, e.g. input parameters and model (structural, behavioral). In this respect, the main topics covered the identification and characterization of all sources of uncertainties in the design model and its parameters together with the related methods, e.g. parametric/non-parametric statistical inference methods from observable data, Bayesian inference, estimation methods (Kernel Density Estimation), and regression analysis.

With the increasing level of uncertainty resulting from unpredictable disturbance/perturbations, unexpected changes/variations, (un)voluntary disruptions, malfunctions, and changes in usage patterns due to socio-economic or technological evolution, current network design, as well as verification and validation methods, are confronted to the fundamental challenge of meeting inter-dependent properties involving resilience, robustness, and sustainability.

On the other hand, this event also aimed at exploiting operational data to develop data-driven techniques for the design of uncertainty sets using statistical hypothesis tests which significantly outperform traditional robust optimization techniques that rely on "a priori" reasoning and domain-knowledge. Indeed the formulation of robust counterparts of optimization problems is intrinsically related to the specification of the uncertainty set by means of data-driven statistical or distributional methods.

RNDM, the annual single-track event established in 2009, has quickly become one of the leading workshops on network resilience and dependability. Despite being located near the European research community, every year it gathers world-class academic and industrial researchers from non-European countries, including, for example, the USA, Canada, Japan, China, or Uruguay.

A total of 55 regular submissions submitted to RNDM 2015 authored by researchers from more than 30 countries were reviewed by 67 TPC members and 57 external reviewers. Each submitted paper received at least four reviews. The 32 accepted manuscripts were finally organized as full and short papers into the following technical sessions:
• Network Resilience Evaluation

Participants of RNDM 2015.

laborative Internet of Things," Dec. 16, 2015 (https://meetings.vtools. ieee.org/m/37439).

IEEE ComSoc Invited Speakers:

•Prof. Matthew Valenti (West Virginia U., USA), "Coverage and Rate in Finite-Sized Device-to-Device Millimeter Wave Networks," Mar. 23, 2015 (https://meetings.vtools.ieee.org/m/33209).

•Prof. Pierre Duhamel (Supélec, France), "Robust Reception of Multimedia: Joint Source, Protocol, and Channel Decoding," Jun. 04, 2015 (https://meetings.vtools.ieee.org/m/34684).

•Dr. Pierre Siohan (Orange Labs, France), "Multi-Carrier Waveforms: State of the Art and Challenges in a 5G Perspective," Jun. 08, 2015 (https://meetings.vtools.ieee.org/m/31935).

•Drs. Sergey Andreev/Olga Galinina (Tampere U. Technology, Finland), "Intelligent Connectivity Enablers for Converged Heterogeneous 5G-IoT" and "Analytical Performance Evaluation of Cooperative and Multi-Radio Concepts," Jun. 09, 2015 (https://meetings.vtools.ieee. org/m/34875).

•Prof. Pablo Piantanida (Supélec, France), "The Wiretap Channel with Generalized Feedback: Secure Communication and Key Generation," Sep. 10, 2015 (https://meetings.vtools.ieee.org/m/35839).

•Prof. Bharat K. Bhargava (Purdue U., USA), "A Mobile-Cloud Pedestrian Crossing Guide for the Blind," Sep. 29, 2015 (https://meetings. vtools.ieee.org/m/35864).

•Mr. Charles Rousseau (Radio-Canada, Canada), "Spectrum Issues for North American Broadcasters" and Mr. Guy Bouchard (CBC, Canada), "Potential Interference from IMT Devices to C-Band Satellite Broadcast Services," Oct. 05, 2015 (https://meetings.vtools.ieee.org/m/36153).

•Dr. Marco Breiling (IEEE BTS DL, Fraunhofer Institute for Integrated Circuits, Germany), "Terrestrial Broadcast vs. LTE-eMBMS: Competition and Cooperation," Nov. 19, 2015 (https://meetings.vtools.ieee. org/m/36603).

Overall, we would like to acknowledge the wonderful volunteers that assisted in any capacity to make these events possible. Special thanks to IEEE Societies that were co-sponsors of these seminars, in particular: IEEE Information Theory Society (ITSoc), IEEE Vehicular Technology Society (VTS), IEEE Signal Processing Society (SPS), and IEEE Broadcast Technology Society (BTS). Moreover, Concordia U., McGill U., U. Québec, ÉTS, and INRS were all gracious to provide facilities for these seminars.

The momentum of our successes will hopefully continue. We already have exciting plans for outstanding speakers in 2016. One such planned event is our first DSP Invitee, Prof. Martin Haenggi (U. Notre Dame, Indiana, USA), who will visit and offer a Distinguished Lecture on "Stochastic Geometry for 5G Cellular Network Modeling and Analysis" for Montréal and Québec City February 18–20, 2016. Stay tuned!

Sustainable Networking," generated much interest among the participants, and was followed by a good discussion. Approximately 16 people attended the talk (mostly staff and students from AUT). Dr. Chiaraviglio also gave another talk, entitled "How to Apply Sustainability in the ICT Sector: The University Role," at the University level. These events were jointly supported by the AUT Sustainability Taskforce and IEEE NZ North Section. Thanks to Dr. William Liu (AUT) for organizing Dr Chiaraviglio's trip to NZ.

Professor Kevin Sowerby Organizes IEEE NZ Wireless Workshop

The IEEE NZ ComSoc chapter organized a day-long IEEE NZ Wireless Workshop on Friday, 4 September, 2015 at the University of Auckland, Auckland. This annual event brought together more than 90 engineers, researchers, industrialists, and policy makers working in the field of wireless communications and network technologies. There was a series of talks by speakers from industry, wireless research centers, and academia, with ample opportunity for informal discussion and networking. The presentations covered various topics and provided a forum for experts in the wireless industry and academia to discuss innovative technologies and research currently in progress. This event provided an excellent opportunity for professional development and networking for the members of the community. Thanks to Professor Sowerby (University of Auckland) for organizing this fruitful event.

Conclusion

The IEEE NZ ComSoc DL program and workshops were very useful for the professional development of the members of the wider university community in 2015. We had four good speakers including ComSoc DL Professor Ying-Dar Lin (from Taiwan) who gave public lectures in three main cities of New Zealand. We had ample opportunities for networking and international links/collaboration. The workshops were effective in promoting networking, academia-industry links, and sharing ideas. The DL program was supported by IEEE ComSoc and AUT.

RNDM 2015/*Continued from page 3*

•Survivability of Content-oriented and Cloud-ready Networking
•Design of Resilient Optical Networks
•Theory of Network Resilience
•Resilience of Wireless Networks
•Fault Management and Monitoring
•Fault Localization and Control
•Inter-play between Sustainability, Resilience, and Robustness in Networks–Parts I-II.

The technical program of RNDM 2015 was extended by two keynote talks by Prof. Bjarne Helvik (Norwegian University of Science and Technology, NO) entitled "Dependability of Non-Engineered and Unmanaged System of Systems," and by Dr. Roland Wessäly (atesio GmbH, DE), entitled "DISCUS: Towards Nation-wide, Scalable, Highly Survivable Fiber Networks." The technical program also included eight invited talks.

The last part of RNDM 2015 was a panel discussion session entitled "Reliability in Information-Centric Networks: Research Challenges and Perspectives," with four panelists: Dr. Achim Autenrieth (ADVA Optical Networking, DE), Prof. Tibor Cinkler (Budapest University of Technology and Economics, HU), Dr. Heiko Niedermayer (Technical University of Munich, DE), and Dr. Dimitri Papadimitriou (Alcatel Lucent Bell Labs, BE).

Considering the Best Paper Award, four papers were nominated (all receiving equal highest overall reviewers' score). The final decision was thus based on presentation quality (scored by chairs of RNDM 2015 technical sessions). This year, the award was given to Roza Goscien and Prof. Krzysztof Walkowiak for their paper entitled "Comparison of Different Data Center Location Policies in Survivable Elastic Optical Networks."

Similar to previous editions of RNDM, in addition to IEEE Xplore publication, participants were provided with printed as well as electronic proceedings. Authors of the top RNDM 2015 papers were invited to submit the extended versions of their contributions to the special issue of *Optical Switching and Networking* journal (Elsevier).

RNDM 2016 will be held in Halmstad, Sweden, on 12–15 September, 2016. More information can be found at http://www.rndm.pl.