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MEMBER RELATIONS

WICE: Promoting the Role of Women in Communications Engineering

Interview with Octavia Dobre, Chair of WICE Standing Committee

By Stefano Bregni, Vice-President for Member Relations, and Octavia A. Dobre, Chair of WICE Standing Committee

This is the eighth article in the series started in September 2014 and published monthly in the *Global Communications Newsletter*, which covers all areas of IEEE ComSoc Member Relations. In this series of articles, I introduced first the seven Member Relations Directors (Sister and Related Societies; Membership Programs Development; AP, NA, LA, EAME Regions; Marketing and Industry Relations) and then the Chairs of the Women in Communications Engineering (WICE) and IEEE Young Professionals (YP, formerly Graduates Of the Last Decade, GOLD) Committees. In each article, one by one they present their activities and plans.

Stefano Bregni

Octavia Dobre

In this issue I interview Octavia A. Dobre, Chair of the IEEE ComSoc Standing Committee on Women in Communications Engineering (WICE). Octavia is an Associate Professor with Memorial University, Canada. She is a Senior Editor with *IEEE Communications Letters*, and an Editor with *IEEE Transactions on Communications* and *IEEE Communications Surveys and Tutorials*. She also serves as Vice-Chair of the Signal Processing for Communications and Electronics Technical Committee and Vice-Chair Americas for the Technical Committee on Cognitive Networks.

It is my pleasure to interview Octavia and offer her the opportunity to outline her current activities and plans for ComSoc WICE.

Stefano: Hello Octavia! I am particularly glad to have the chance to interview you here and to offer you this opportunity to present the activities of the IEEE ComSoc Standing Committee on Women in Communications Engineering (WICE). At the beginning of my term as VP-MR, I indicated women among the five strategic directions to pursue in Member Relations to ensure innovation and balanced growth of ComSoc. Therefore, your Committee is key to this goal. Would you recall its history and mission?

Prof. Andrea Goldsmith receiving the WICE Outstanding Achievement Award (2014).

Prof. Sarah Kate Wilson receiving the WICE Outstanding Service Award (2014).

Octavia: In 2014, WICE became a Standing Committee of ComSoc, after being an Ad-Hoc Committee for three years. The dedication of its former chairs — Heather Yu (2011), Sarah Kate Wilson (2012), and Shalinee Kishore (2012) — made this possible. WICE's mission is to promote the visibility and roles of women communications engineers and to provide a venue for their professional growth. We hope that many ComSoc members will get involved and contribute to the mentoring and promotion of women communications engineers, as well as to increasing their membership.

Stefano: Due to a number of historical reasons, women are significantly under-represented in most engineering disciplines, including communications. What's more, for a long time there have been even fewer women in visible leadership positions. Therefore, our challenge in WICE is working to improve balance and to grant true equal opportunities to both genders, in ComSoc and in our professional world of communications engineers. How is the WICE Committee facing this challenge? What have been its main activities in 2014?

Octavia: A mandate of WICE is to promote women communications engineers. Certainly, this cannot be done without the support of professional women leaders, as well as the entire ComSoc community. WICE has been fortunate to have such support. However, there are also challenges. One of them is to have a larger number of dedicated volunteers, which would allow us to initiate additional activities. We have spread the word about WICE through Facebook, LinkedIn, and the WICE website, as well as speaking directly with attendees at Globecom and ICC, in order to attract more volunteers.

In 2014, we organized the Second Women's Workshop on Communications and Signal Processing, where we presented the Best Poster Presentation Award to a junior participant for the first time, and additionally presented the WICE Awards for the first time.

Stefano: Awards are well appreciated to acknowledge publicly outstanding contributions to the profession and ComSoc.

Octavia: To recognize the ComSoc members who bring outstanding contributions to the profession and WICE, starting in 2014 we will present three annual awards:

- Outstanding Achievements Award for exceptional technical work in the broad field of communications engineering.
- Outstanding Service Award for a distinguished record of service and excellent leadership within WICE.
- Mentorship Award for strong commitment to mentoring WICE members, significant positive impact on the mentees' education and career, and advancing communications engineering through mentees.

The first-time recipients of the WICE awards were Prof. Andrea Goldsmith (Stanford University) for the Outstanding Achievements Award; Prof. Sarah Kate Wilson (University of Santa Clara) for the Outstanding Service Award; and Dr. Larry Greenstein for

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CONFERENCE REPORT

Second IEEE ICCC International Workshop on Internet of Things (IOT 2014), Shanghai, China

By Antonio J. Jara, Kaoru Ota, Ruonan Zhang, and Wei Wang, ICCC IoT Workshop Publicity CoChairs

The IEEE/CIC International Conference on Communications in China (ICCC) is an international conference series newly incubatedby the IEEE Communications Society (ComSoc) in partnership with the China Institute of Communications (CIC) aiming at realistic globalization by extending ComSoc's reach to the fastest growing regions. ICCC is the flagship conference of the IEEE ComSoc in China that is held every year in the greater China region. Since its commencement in 2012, ICCC has grown steadily from a brand new conference with a strong vision, to a unique venue that brings together global researchers and practitioners in areas of communications.

ICCC 2014, the third edition of ICCC that follows the great success of ICCC 2012 in Beijing and ICCC 2013 in Xi'an, was held in Shanghai on October 13-15, 2014. Shanghai is the largest Chinese city by population and the largest city proper by population in the world. It is one of the four direct-controlled municipalities, with a population of more than 24 million as of 2013. It is a global financial center, and a transport hub with the world's busiest container port. Located in the Yangtze River Delta in East China, Shanghai sits at the mouth of the Yangtze in the middle portion of the Chinese coast.

ICCC 2014 featured four world-class plenary keynote speeches, eight technical symposia, five tutorials, four industrial and academic panels, and one workshop. The second IEEE ICCC international workshop on Internet of Things (IOT 2014) was the only workshop within ICCC 2014 and consisted of two sessions, sharing the same aim as IOT 2013: to provide a forum for authors to present early research results on Internet of Things (IOT) that advance the state of the art and practice in IOT, including theoretical principles, tools, applications, systems infrastructure, and test beds for IOT.

IOT has been the national strategy of China since 2009, and it maintains collaboration worldwide. The counterpart of IoT in the United States is cyber-physical systems (CPS) with initiatives such as SmartAmerica and with the leadership of the Industrial Internet Consortium (IIC) and IPSO Alliance to promote the use of Internet of Things, standardization, and market development. Finally, many other federal agencies have a common stake in the IoT, CPS, and Industrial Internet research and development. Finally, the European Union presents the strongest support worldwide for Internet of Things development through the European Research Cluster on the Internet of Things (IERC), IoT iniative

Shanghai Chenhuangmiao (Yuyuan Garden Bazar).

IOT 2014 Welcome Opening Speech by TPC Chair Prof. Qinghe Du.

IOT 2014 Invited Talk by Prof. Bijan Jabbari.

(IoT-i) with the IoT Forum development, IoT architecture (IoT-A) and a wide range of projects in order to address the key challenges of Internet of things in terms of cloud computing integration (OpenIoT, iCore), IPv6 support (IoT6), gateway integration (BUTLER), integration (SmartAction), and other key projects as part of the Framework Programme 7. Nowadays, the Internet of Things continues to be a priority for the European Union, with a special focus on the development of consolidated ecosystems that enable the exploitation for a wide range of markets, users, entrepreneurs, and consequently makes feasible the development of a collaborative value-chain for the Interne of Things. These ecosystems are expected to build a high impact with the development of Large Scale Pilots and Developments toward 2020.

IOT 2014 was a joint effort between the Internet of Things Emerging Technical Subcommittee within the IEEE Communications Society, including Prof. Latif Ladid and Prof. Antonio J. Jara, the founders of the IOT workshop series within ICCC, including Prof. Houbing Song, Prof. Qinghe Du, and Prof. Ruonan Zhang, and the broader IOT research community, including Prof. Bin Xia, Prof. Shengjie Zhao, Prof. Kaoru Ota, Prof. Xiaohua Tian, and Prof. Wei Wang.

The current IEEE positioning of the Internet of Things goes beyond with the development of the IEEE IoT World Forum, IEEE IoT Journal, IEEE P2413 Standard for the Internet of Things Architecture, and other activities from the IEEE IoT initiatie and the IEEE ComSoc Internet of Things Emerging Technical Subcommittee. The support of the community in the ICCC conference and the great numbers of attendees and contributions, demonstrate that Internet of Things is a top topic and enabler worldwide with a highly expected impact in our society during the coming years. Nowadays several challenges are pending in issues such as security, scalability, interoperability, and user-acceptability. We expect that the research community worldwide will continue to work on these topics within IEEE ICCC IOT 2015.

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TECHNOLOGY UPDATE

LTE-Assisted WiFi Direct Trial

By Sergey Andreev and Yevgeni Koucheryavy, Tampere University of Technology, Finland; Jiri Hosek, Brno University of Technology, Czech Republic; and Kerstin Johnsson, Intel Corporation, US

As the dust around 5G settles, one thing is clear: 5G will be a synergistic integration of numerous, diverse technologies (rather than one defining technology) that radically improves the performance of wireless networks. LTE-assisted WiFi Direct is considered a vital part of this 5G vision due to its ability to augment network capacity and enhance user performance without increased infrastructure cost. The use of WiFi Direct offloads the costly cellular bands, improves reuse (WiFi has a shorter range than LTE), and boosts user data rates (WiFi has a much larger bandwidth than LTE). These benefits are further enhanced by assistance from the LTE operator. LTE assistance automates WiFi Direct device discovery as well as connection establishment. It expands the number of potential WiFi Direct connections by providing secure access to strangers. It reduces battery and channel consumption by performing device proximity detection on the user's behalf. Finally, it provides service continuity to users by enabling a communication path via the LTE infrastructure if/when users move too far apart for successful WiFi Direct communication.

LTE-Assisted WiFi Direct on a 3GPP LTE Deployment

Motivated by the many potential benefits of LTE-assisted WiFi Direct and building on our extensive past research in this area, we committed to deploy this promising technology and comprehensively demonstrate its benefits in the summer of 2014. To this end, we have completed a full-scale trial of LTE-assisted WiFi Direct on a live 3GPP LTE deployment in Brno, Czech Republic. This unique trial builds upon 3GPP-compliant D2D technology, features our patented signaling protocols, and significantly extends our initial demo shown at Mobile World Congress in early 2014. This effort unites partners from Tampere U. of Technology (TUT), Brno U. of Technology (BUT), and Intel Labs US.

Our trial reveals that LTE-assisted WiFi Direct does, in fact, significantly improve network and user performance. This technology essentially creates large numbers of "small cells" that relieve cellular network congestion without the additional CAPEX/OPEX associated with deploying pico-/femto- cells. As long as the proper offloading criteria are set, LTE-assisted WiFi Direct overcomes the limitations of conventional WiFi, such as session continuity failures, excessive user contention, and cumbersome security and connection establishment procedures.

Group photo from the seminar on Network-Assisted D2D.

Our Continued Work on LTE-assisted WiFi Direct

Upon conclusion of the trial, we hosted a seminar at Brno University of Technology to discuss lessons learned, industry implications of the technology, and future research directions. This seminar brought together representatives from a variety of mobile network operators, vendors, and manufacturers including Intel Labs, AT&T, Nokia, T-Mobile, France Telecom, Honeywell International, Fraunhofer Institute (FOKUS), Brno University of Technology, Tampere University of Technology, and Vienna University of Technology.

The described trial was performed in laboratories of the SIX Research Centre; our current work on network-assisted proximate communications continues with support from the Academy of Finland. With this funding we are researching issues of security and privacy in the context of D2D, as well as its performance evaluation aspects (as part of a postdoctoral researcher grant by the first author). We are also supported by grants from the Internet of Things program of DIGILE (funded by Tekes). This funding supports research into D2D technology improvements specific to IoT usage scenarios. More details on the recent trial and the follow-up seminar are available at the following links:
http://winter-group.net/brno-trial/
http://wislab.cz/our-work/lte-assisted-wifi-direct

Please contact the authors (sergey.andreev@tut.fi, hosek@feec.vutbr.cz, kerstin.johnsson@intel.com, yk@cs.tut.fi) for further information about the research, demos, or trial.

WORKSHOP REPORT

Nets4Cars: 2014 Fall Workshop in Saint Petersburg, Russia

By Alexey Vinel, Sweden

The International Workshop on Communication Technologies for Vehicles (Nets4Cars) is a series of workshops that provides an international forum on the latest technologies and research in the field of intra-vehicle and inter-vehicle communications. The workshops are organized annually to present original research results in all areas related to physical layer, communication protocols and standards, mobility and traffic models, experimental and field operational testing, and performance analysis.

First launched by Tsutomu Tsuboi, Alexey Vinel, and Fei Liu in Saint Petersburg, Russia in 2009, Nets4Cars workshops have been held in Newcastle-upon-Tyne, UK (2010), Oberpfaffenhofen, Germany (2011), Vilnius, Lithuania (2012), Villeneuve d'Ascq, France (2013), and Offenburg, Germany (2014). The 2014 workshop, the seventh in the series, took place at Hotel New Peterhof, Saint Petersburg, Russia, on 6-8 October 2014, with the technical support of the V. A. Trapeznikov Institute of Control Sciences of the Russian Academy of Sciences, Russia, and Halmstad University, Sweden. The technical sponsors of the event were the IEEE Russia (Northwest) Section BT/CE/COM Joint Chapter and IFIP WG 6.8. Open call for papers resulted in 18 submissions. Each of the papers was assigned to the Technical Program Committee members or external reviewers, with each paper receiving at least three independent reviews. A total of 11 papers were accepted for publication, and all were presented at the workshop and are available in IEEE Xplore.

The Best Paper Award Ceremony: Tetiana Zinchenko (Volkswagen AG, Germany) and Alexey Vinel (Halmstad University, Sweden).

The keynote speakers were Antonio Bicchi (University of Pisa, Italy), Panos Papadimitratos (KTH, Sweden), and Evgeny Belyaev

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the Mentorship Award. These awards were presented at the WICE meeting held at IEEE Globecom 2014, in Austin, Texas.

Stefano: And what about Women's Workshops?

Octavia: In July 2014, WICE organized its Second Women's Workshop on Communications and Signal Processing at Princeton University. The event was a success, representing not only a unique opportunity for both junior and senior women researchers to interact about the new developments in their fields, but also an excellent possibility for mentoring and networking. There were 33 participants from the USA, Canada, Turkey, UK, UAE, and Sweden, among which 19 were junior attendees. The junior participants had poster presentations, while the senior participants gave invited talks. A best poster presentation award, sponsored by ComSoc, was presented for the first time. Different workshop attendees shared their personal stories, related to both career and family, which are available as interviews on the ComSoc Beats website (http://beats.comsoc.org/).

Stefano: You mentioned that you aim at achieving a wider participation of women in ComSoc activities by direct advertising and via the social media.

Octavia: Our members are informed about the WICE activities and events through the WICE website, Facebook, and LinkedIn, as well as through the mailing list. Last year we created the mailing list, which has more than 4,000 subscribers already. If you are interested in becoming a member of WICE, please subscribe to our mailing list. Information about that is provided on our website (committees.comsoc.org/WICE).

Stefano: This year we attempted to launch a new initiative, which attracted utmost interest by everyone: child care at ComSoc conferences. Regrettably, we experienced some difficulties which hindered our plans. Would you please summarize what is the current situation?

Octavia: We believe that providing child care at ComSoc conferences represents a valuable service for our members, both male and female. For this reason, we discussed with IEEE the possibility of launching the program through a pilot project at ICC 2015. Recently, IEEE advised that the attendees should contact corresponding services directly. Hopefully, in the future offering such a service to our ComSoc members will be possible.

Stefano: You are also working to promote highly-qualified participation of women among candidates for distinguished positions in ComSoc.

Octavia: Another initiative is to nominate outstanding WICE members for the Distinguished Lecturer Program. An announcement about nominations will be sent to our members via the mailing list. We also aim to increase the number of IEEE Senior and Fellow members from the WICE community, by nominating suitable candidates.

Stefano: What is your final call to ComSoc members?

Octavia: When different voices are represented in a group, everyone benefits. ComSoc recognizes that diversity is essential to the technical community and to the greater society. WICE welcomes participation from all ComSoc members. If you are interested in contributing, we would like to hear from you.

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Following are the organizers of IOT 2014

General chairs: Houbing Song, West Virginia University & West Virginia Center of Excellence for Cyber-Physical Systems; Latif Ladid, ComSoc Internet of Things Subcommitte; Bin Xia, Shanghai JiaoTong University.

Technical Program Chairs: Shengjie Zhao, Tongji University; Qinghe Du, Xi'an Jiaotong University; Xiaohua Tian, Shanghai JiaoTong University

IOT 2014 received 18 papers and accepted eight papers. Papers were submitted from three continents: Asia, North America, and Europe. These papers covered the following topics:

- Theoretical Foundations of Cyber-Physical Systems/Internet of Things
- Modeling, Analysis and Synthesis Techniques
- Architectures for Cyber-Physical Systems/Internet of Things
- Building Blocks for Cyber-Physical Systems/Internet of Things
- Systems Abstractions, Services and OS Support
- Evaluation Approaches and Metrics
- Novel Cyber-Physical Systems/Internet of Things Applications
- Detailed Case Studies
- Security/Privacy

IOT 2014 also featured two invited talks by Prof. Bijan Jabbari, professor in the Department of Electrical and Computer Engineering at George Mason University, on the topic "Ad Hoc Networks: The Enabler for the IoT"; and Prof. Hengchang Liu, assistant professor at the School of Computer Science and Technology at the University of Science and Technology of China, on the topic "A Penalized Maximum Likelihood Approach for M-Year Precipitation Return Values Estimation with Lattice Spatial Data".

IOT 2015 will be held in Shenzhen, China in conjunction with ICCC 2015 (http://www.ieee-iccc.org/2015/).

NETS4CARS 2014/*Continued from page 3*

(Tampere University of Technology, Finland). The Best Paper Award was presented to Tetiana Zinchenko (Volkswagen AG, Germany) for her talk entitled "Reliability of Vehicle-to-Vehicle Communication at Urban Intersections".

We invite all the experts in the field of vehicular networking to join us in Sousse, Tunisia for Nets4Cars/Nets4Trains/Nets4Planes-2015 in May 2015, and in Munich, Germany for Nets4Cars-2015-Fall in October 2015. Visit: www.nets4cars.eu