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REGIONAL REPORT

IEEE Young Professionals, Lahore Section Win World Class Award "Hall of Fame 2015"

By Usman Munawar , IEEE Lahore Section, Pakistan

The IEEE Young Professionals Lahore Section, after winning the IEEE Hall of Fame Award 2011, the IEEE YP Region 10 Award 2012, and the MGA Individual Award 2012, has won the IEEE Hall of Fame Award 2015. Today our Young Professionals, Lahore Section list of active members has reached more than 50. More professionals are coming in to join our cause of serving the society. IEEE YP strives to bring reforms to the engineering sector in our country with valuable efforts and approaches in the engineering profession. The Hall of Fame 2015 Award is a tribute to our seniors for such achievements for Pakistan and Region 10.

SUMMARY OF THE EVENTS HELD IN 2014

IEEE PSYWC 2014: IEEE Pakistan Student, YP (Young Professionals), and WIE (Women In Engineering) Congress (PSYWC) was the largest event for the students and young professionals in the three IEEE sections (Lahore, Islamabad, and Karachi). The three-day event united 450 students, young professionals, and women in engineering, computer science, and allied fields to explore ideas, develop skills, and discuss issues in their profession. Students had a chance to interact with highly professional academia and industry personnel.

IEEE Technovate 2014: IEEE Technovate 2014 was a collaboration of IEEE Young Professionals Lahore, IEEE Lahore Section, with the IEEE team IEEE from Egypt that treads on the path paved by the Egyptian Engineering Day (EED) program, which is celebrated annually in Egypt (Region 8). The aim of this event was to select the best projects of Pakistan so those involved could be sponsored to fly to Egypt to compete on the next Regional level with the best projects of the entire region on the prestigious Egypt Engineering Day (EED).

Brainiac 2014: BRAINIAC 2014 was organized in collaboration with ICOSST 2014, a perfect mix of technical and non-technical competitions, seminars, conferences, and workshops. This three-day exciting venture consisted of a Business Idea competition, an Android App Development Competition, Extreme Programming, a Web Design Competition, a Pseudo Code Competition, and Circuit Mania.

Formation and promotion of new chapters, affinity groups, and student branches: A new milestone was achieved by establishing an IEEE PES Student Chapter for the first time in Pakistan by IEEE YP. The PES Young Professionals Committee is now dedicated to better serving student members of PES and assisting PES Young Professional members in their transition to corporate life. In addition to this, the IEEE YP Lahore Section played its vital role in introducing three technical Chapters (IEEE PES, IEEE IAS, and IEEE ComSoc), an Affinity Group (IEEE Consultant Network),



Members of the IEEE Young Professionals Lahore Section with the 2015 IEEE Hall of Fame Award.

five Student Branches (IEEE IIUI, IEEE BZU, IEEE SCET, IEEE UOG, and a fifth in process, IEEE CIIT Sahiwal, and seven Technical Society Student Chapters (four IAS Student Chapters (UET, LCWU, IUB and GCUF), and three PES Chapters (NFC, CIIT, and LCWU). IEEE Young professionals kept its eyes on the promotion of IEEE Societies to empower and update knowledge of IEEE members in the section, which has proven very valuable for engineers and society itself.

IEEE Day Celebrations UMT: An IEEE Student Branch was established at the University of Management and Technology on this special occasion. The event proved to be a greatly successful membership campaign. Various IEEE volunteers and student representatives highlighted the advantages of being an IEEE member and how IEEE provides countless opportunities in technology.

Major Achievements: Adding to the list of mega events are the 8th IEEE ICOSST, IEEE STEP, IEEE SPAC, IEEE NWPE, IEEE Fetex 2015, IEEE Final Year Project Exhibition 2014, and 6TH IEEE AEPEX 2014, and industrial visits (PTCL and KICS).

Recipe for IEEE YP Success: IEEE Young Professionals of Pakistan is an international community of enthusiastic, dynamic, and innovative members and volunteers. IEEE is committed to helping young professionals and graduates in order to develop their skill set. IEEE YP members are volunteers who help young graduates and professionals in recognizing their career path and goals and providing them with consultation and career counseling. IEEE YP plans and manages all the events with one common and main objective of professional development in Pakistan. IEEE YP held more than 20 Board meetings and general meetings in order to brainstorm events and out of the box ideas and to bring them to reality.

IEEE YP Team: IEEE YP includes more than 20 members who have been designated with multiple projects. Our Executive Committee includes the following professionals

- Dr. Amjad Hussain, Mentor
- Mr. Maroof Raza, Mentor
- Mr. Ijlal Haider, Mentor
- Usman Muhammad Ali, Chair, YP; Lecturer, University of Sargodha
- Usman Munawar, Secretary, YP; Research Office, University of Engineering and Technology, Lahore, Pakistan

(Continued on Newsletter page 4)

Distinguished Lecturer Tour of Nei Kato in China, May 2015

By Waheed ur Rehman, Beijing ComSoc Chapter Secretary, Weixiao Meng, Harbin ComSoc Chapter Chair, Liu Jia Jia, Xian ComSoc Chapter, China

Prof. Nei Kato was invited by the Xian, Beijing, and Harbin ComSoc Chapters to conduct a ComSoc Distinguished Lecturer Tour in May 2015. The first lecture was held at Xidian University on 15 May, which was hosted by the Xian ComSoc Chapter. The lecture topic was "Device-to-Device (D2D): Research Trends and Future Perspectives." There were more than 40 attendees including faculty members and graduate students from Xidian University. The attendees were very interested in the lecture topic and they actively participated in the Q&A session, asking questions ranging from current research progress of D2D to future open problems. They also raised practical issues regarding the achievable performance and implementation details of the "Relay-by-Smartphone" D2D prototype.

Prof. Kato delivered his second lecture at Beijing University of Posts and Telecommunications (BUPT) on 18 May 2015. It was hosted by the Beijing ComSoc Chapter. There were approximately 50 attendees, including university students, academic researchers, and public participants from ICT related industries. Prof. Kato started the lecture with background information about D2D and why we need it. The technical presentation covered a range of interesting details about D2D and the recent research development in this field. Prof. Kato also showed a short video about interesting research conducted in his lab, where the students showed how to send a message up to 2.5 km without any infrastructure. There were many different insights and raised curiosities in the participants' minds, which was then reflected during the Q & A session. The lecture was about an hour. Participants were very interested in the topic and contents. After the lecture, Prof. Kato had additional discussions with the other professors at BUPT, and he visited the related labs.



After the lecture at the Xi'an Chapter.



Prof. Nei Kato gave a technical presentation at the Harbin Institute of Technology.

After the lectures in Beijing, Prof. Kato traveled to Harbin to conduct his technical talk at Harbin Institute of Technology on 21 May 2015. The lecture was hosted by the Harbin ComSoc Chapter. Prof. Kato analyzed the background and significance of D2D, proposed that in the case of spectrum scarcity of resources, it is possible to increase the cellular communication system spectral efficiency and reduce terminal transmit power for D2D to a cer-

(Continued on Newsletter page 4)

Distinguished Lecturer Tour of Tom Hou to Beijing and Nanjing, China

By Waheed ur Rehman, IEEE Beijing ComSoc Chapter Secretary, and Prof. Lianfeng Shen, IEEE Nanjing ComSoc Chapter Chair, China

Dr. Tom Hou, IEEE Fellow, was invited by the IEEE Beijing Communications Society Chapter to give a 90-minutes lecture on "Advances in Wireless Networking for Cyber Physical Systems" on 6 May 2015 (Wednesday). The lecture was held at Beijing University of Posts and Telecommunications (BUPT) from 3 pm to 4.30 pm. There were approximately 30 attendees, including university students, academic researchers, and public participants from ICT related industries.

The lecture began at the preliminary level for the need and significance of cyber and physical systems (CPS). Dr. Hou's lecture focused on two main areas. First, he discussed the throughput in multi-hop wireless networks, which is a fundamental problem in CPS. Second, he considered the energy problem in sensor networks, which is another fundamental problem. Finally, Dr. Hou talked about the new frontiers in sharing radio spectrum and co-existence between primary and secondary networks beyond dynamic spectrum access.



Lecture at National Mobile Communications Research Lab, Southeast University.

Participants were very interested in the topic and contents, and they actively asked their questions during the Q&A session, with the questions covering both the basic and professional aspects of the topic. Due to the shortage of time, several participants had further exchanges with Dr. Hou after the session ended.

It was a pleasure for the Beijing ComSoc Chapter to host Dr. Hou, and the lecture brought many significant ideas to the research students.

After the technical talks in Beijing, Dr. Hou was invited to give

(Continued on Newsletter page 4)

European Wireless 2015 in Budapest

By Hassan Charaf, Frank Fitzek, Leonardo Badia, Marcos Katz and László Lengyel, Hungary

The 21st European Wireless (EW) Conference took place in Budapest, Hungary, 20-22 May 2015, and was organized by the Budapest University of Technology and Economics (BME) with the cooperation of VDE-ITG, represented by Klaus D. Kohrt, Germany, and HTE, represented by Peter Nagy, Hungary, both of them Sister Societies of ComSoc. BME is the most significant University of Technology in Hungary and is also one of the oldest Institutes of Technology in the world, having been founded in 1782. The 2015 edition of EW aimed at addressing the key theme of "5G and Beyond," with a focus on the latest trends, developments, and of course the future applications on top of the mobile and wireless communications. On the first day six tutorials, organized by Sergio Palazzo and Morten V. Pedersen, were offered in three tracks covering two different topics on 5G, Device-to-Device, IoT, network coding, and network programming for Android platforms.

The Technical Program of the conference consisted of 86 papers from more than 30 countries selected after a detailed review process, and was enriched by three keynote talks by Eric Dahlmann, Muriel Médard, and Tommaso Melodia. Eric



Thanks for Muriel Médard after the keynote.

Dahlmann from Ericsson explained the future of 5G and the evolution from previous cellular systems. Muriel Médard spoke about the interaction between network coding and the physical layer. Tommaso Melodia gave an interesting speech entitled "Toward Ultrasonic Networking for Implantable Intra-body Networks."

EW2015 featured two workshops (organized by Christian Wietfeld, László Lengyel, and Péter Ekler), with the topics "Device-to-Device Communication for 5G Systems (WD2DC)" and "Coding Techniques for 5G Networks."

Continuing with the tradition of the European Wireless conference, the scope of EW15 was broad, including, in addition to the subjects of the main conference theme, the most relevant topics in modern communications. This was one of the reasons why most conference attendees, more than 100 colleagues, were present continuously during the conference.

Accepted papers (all available on IEEE Xplore) were organized into 16 technical sessions.

The next EW conference will be held in Oulu, Finland on 18-20 May 2016. The theme for European Wireless 2016 is "5G: Applications, Businesses and Technologies." More information can be found at <http://ew2016.european-wireless.org/>.



The organizing Committee during the Conference dinner.

Novel In-Band Full-Duplex Communication Prototype for 5G Systems, Finland, May 2015

By Mikko Valkama, Professor at Tampere University of Technology

As 5G radio system research is rapidly developing and is attracting significant global interest, a team of researchers at Tampere University of Technology (TUT), led by Prof. Mikko Valkama, has been developing and building an advanced radio transceiver concept for improving the spectral efficiency of future 5G networks. 5G networks are aiming at very large data rates, very high capacity, very low latency, and very fast response time. The developed prototype is based on the principle of wireless in-band full-duplex communications, which means that transmission and reception are performed at the same time on the same center-frequency. Thus, all of the temporal and spectral resources can be used for both transmitting and receiving data, unlike in the traditional frequency-division or time-division duplexing based schemes. This can as much as double the spectral efficiency, which is a highly tempting feature for the upcoming high-data-rate 5G networks. However, the prevalent technical challenge in



Mikko Valkama (left), Shilpa Talwar, Yang-Seok Choi, Timo Huusari and Dani Korpi demonstrated in-band full-duplex communications at the 2015 Mobile World Congress.

such an in-band full-duplex transceiver is the own transmit signal, which is a powerful source of self-interference for the sensitive receiver circuitry. Thereby, without highly efficient attenuation of the own transmit signal in different parts of the receiver chain and antenna interface, in-band full-duplex communication is not possible.

Recently, in close collaboration with Intel Wireless Labs, the researchers at TUT have managed to greatly alleviate this problem by using various advanced RF/analog and digital self-interference cancellation techniques. With the current version of the

(Continued on Newsletter page 4)

DLT/NEI KATO/Continued from page 2

tain extent. He described the mechanism of DTN proposed by his group. It was suitable for the case when irregular nodes moved in a large scale with faster velocity or nodes were sparse, which could solve the routing failure of MANET caused by nodes' changes and movements to some extent. He also demonstrated a D2D application in the emergency network using a MANET and DTN's mixed strategy that was very effective. During the lecture, professors and students discussed the trends of D2D such as "the security issues of D2D," "the shortest path problem of D2D" and "the validity period of DTN information," among others. Prof. Kato also talked about the research activities on wireless networks in Tohoku University, providing valuable information to the local professors and students. There were approximately 100 attendees at the lecture.

Prof. Kato also attended a seminar organized by Prof. Weixiao Meng's group (Monday Seminar). Prof. Kato patiently provided guidance and directions to students in their research domain, and also had a discussion with the students and other professors, which lead to new ideas in their research work. The participants were impressed with Prof. Kato's rigorous learning style and pleasant personality.

DLT/TOM HOU/Continued from page 2

an IEEE Distinguished Lecture in the China Network Valley, which is supported by IEEE ComSoc Nanjing, on 11 May 2015. This talk was hosted by Prof. Xiaohu You from Southeast University. More than 150 attendees included professors and students from the IEEE ComSoc Nanjing Chapter.

During the lecture, Dr. Hou mainly discussed MIMO's related computational model in multi-hop wireless networks. First, Dr. Hou presented a clear classification of the existing MIMO model, which contains a matrix-based model and DOF-based model. The DOF-based model is divided into a conservative model and an optimistic model. Second, Prof. Hou focused on some new advances related to MIMO's capability in a multi-hop network environment. He presented his research on an optimal computational model, a new enabling technology to be used in the physical layer and the network layer, which combines the advantages

of the conservative model and the optimistic model. Finally, Prof. Tom Hou proposed that most of these research advances were interdisciplinary and required a synergistic exploration of knowledge bases from multiple technical domains for future research.

In the question and answer session, Prof. Hou gave detailed and professional answers to the teachers' questions concerning MIMO modeling, and the students' questions about opportunities for member recruitment. This gave audiences a better understanding of wireless networking and also stimulated their interests in exploring this area.

PROTOTYPE FOR 5G/Continued from page 3

prototype, the own transmit signal can be attenuated by as much as 110 dB, in spite of adopting low-cost RF components, already allowing for true full-duplex operation with low-to-medium transmit power levels. This was also demonstrated at the 2015 Mobile World Congress in early March, where Prof. Valkama and researchers Timo Huisari and Dani Korpi from TUT, together with Dr. Yang-Seok Choi and Dr. Shilpa Talwar from Intel, showcased their full-duplex prototype. The demonstration attracted great interest from the industry and research community alike. Thus, it is clear that these recent advances in full-duplex device implementations show great promise for improving the spectral efficiency of the next generation wireless networks.

In addition to successful research into in-band full-duplex transceivers, Prof. Valkama's group at TUT has also made innovative progress in other fields related to 5G networks, such as 5G radio interface and radio system design, radio localization, transmitter linearization, and cognitive radio. Moreover, his group has been given recognition and praise for their work from the Finnish Funding Agency for Innovation (Tekes) and Academy of Finland.

For further information about the research and demonstrations, please contact the authors (mikko.e.valkama@tut.fi, dani.korpi@tut.fi). Further technical information related to the full-duplex radio research is available at <http://www.tut.fi/full-duplex/>.

HALL OF FAME 2015/Continued from page 1

- Sahar Sultan, Vice Chair, YP; Lecturer, Lahore College for Women, University of Pakistan
 - Faiza Nasir, Treasurer, YP; Zong CMPak
- Below are project managers working in IEEE Young Professionals:
- Ms. Anum Tariq Khan, Project Coordinator Trainings, IEEE beENG Program
 - Mr. Rana Hassan, Project Coordinator Industry, IEEE beENG Program
 - Mr. Ehtasham Khan, Media Manager, YP
 - Mr. Muhammad Haris, Project Manager, IEEE Mentoring Program
 - Ms. Rabail Khizar Malik, Program Drive Lead/Project Manager, IEEE beENG Program
 - Mr. Saad Zafar, Project Manager, Graduate Assistance Program
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