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CHAPTER REPORT

Recent Activities in the ComSoc Southwestern USA Region 5

By T. Scott Atkinson, North America Region Board Member, USA

This is a summary highlighting some of the ComSoc Chapter activities in IEEE ComSoc Southwestern USA Region 5, which includes the states of Texas, Louisiana, Arkansas, Missouri, Kansas, Colorado, Oklahoma, Texas, and parts of New Mexico and South Dakota.

IEEE Central Texas Section COMSOC/SP Austin Joint Chapter

The Austin Chapter hosts technical meetings regularly during the year. Following are the topics of the most recent meetings.

September: "Multicore Processor Solutions for Smart Factories, Smart Cities and Smart Energy." Presenter: Mr. Altaf Hussain, Business Development Manager, Freescale's Digital Networking group.

October: "Machine Learning and Signal Processing Methods in Live Business Intelligence Operations." Presenter: Dr. Choundur Lakshminarayan, Principal Research Scientist, HP.

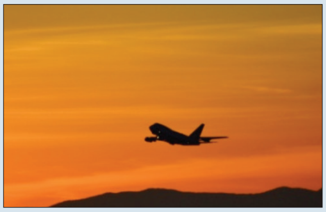
November: "Trustworthy Hardware." Presenter: Distinguished Prof. Ramesh Karri, Prof. ECE, Ploytechnic Institute, NYU.

In November, chapter members celebrated their two ComSoc awards:

- 2015 ComSoc North America Region Chapter Achievement Award.
- 2015 ComSoc Chapter of the Year Award.

IEEE Central Texas Section COMSOC/SP San Antonio Joint Chapter

In February, the chapter hosted Distinguished Lecturer Prof. Koichi Asatani at a joint meeting with the San Antonio Life Members Group and the Student Branch at the University of Texas at San Antonio.



NASA's Stratospheric Observatory for Infrared Astronomy (SOFIA) takes off from Palmdale, California at sunset. SOFIA is a partnership of NASA and the German Aerospace Center (DLR); NASA and DLR have collaborated on a range of activities and signed agreements on June 16 to work together to reduce aircraft noise and advance research into rotorcraft.

In June, at a meeting held jointly with the San Antonio Life Members Group, Scott Atkinson spoke on the topic of NASA's Stratospheric Observatory for Infrared Astronomy (SOFIA) Project.

In October the ComSoc/SP Joint Chapter participated in the Engineering in Medicine and Biology Society Chapter Distinguished Lecturer meeting, along with Computer Society members. Dr. Michael Jirjis spoke on "Diffusion Tensor Imaging of the Central Nervous System Following Spinal Cord Injury and Stem Cell Transplant."

IEEE ComSoc Galveston Bay Chapter

The August Section/Chapter meeting focused on a seminar presentation on the topic "A Glimpse of the Future World: When Integrated Unmanned Systems Meet Artificial Intelligence," presented by Hao Xu, Ph.D., Director of the Unmanned Systems Laboratory (TAMUCC-USL).

Unmanned systems (US) (unmanned aircraft systems (UAS), unmanned ground vehicles (UGV), and unmanned underwater robots) are smart mission-based agents equipped with well-developed on-board sensors, microprocessors and communication devices (e.g. lasers, GPS, HD-cameras, sonars, optical/RF transceivers, etc.). USs can successfully complete numerous tasks such as disaster search/rescue, emergency response in extreme environments, etc., which human beings would not be able to finish easily. Recently, different types of USs have been integrated to cover broader operations. However, due to a lack of effective integration methods, emerging integrated unmanned systems (IUSs) are still very difficult to be implemented into practical systems. To overcome this challenge, the cutting-edge artificial intelligence (AI) technique is being adopted to work with IUSs. This talk covered the background of USs and AI and their potential IUS applications, enumerating their applications and challenges. Effective AI-based algorithms will be developed to improve the performance of IUSs, leading to their future applications.

In October, the Chapter supported the Section in the coordination of the Section's annual DUAL Conference of Innovation and Automation 2015.

In November, a unique seminar was organized by the Chapter for the Section meeting. The topic of the seminar was "Engineering Contributions to Medicine: What Else Can Be Done?" The presenters were Paul Frenger, MD, SM-IEEE, SM-ISA, LM-ACM (practicing physician); Reese Terry, Life Fellow-IEEE, retired founder and CEO of Cyberonics; John Criscione, MD, Ph.D., associate professor, Texas A&M; and Ershad Sharifahmadian, Ph.D., visiting professor, University of Houston Clear Lake.

IEEE ComSoc Tulsa Chapter

The IEEE ComSoc Tulsa Chapter offers a weekly seminar (Tuesday 11:45 AM-1:00 PM) for all IEEE ComSoc Tulsa Chapter members. These weekly seminars are presented by The University of Oklahoma–Tulsa's MS or Ph.D. students, or occasionally by a guest lecturer. These seminars are related to telecommunication technologies such as wireless communication, quantum communication, image processing, etc. Following are titles of the most recent seminars:

- October 6, 2015: "Research and Analysis of Medication Adherence in an Adult Type 2 Diabetes Cohort."
- October 13, 2015: "Big Data!"
- October 20, 2015: "Secure AES Key Transmission Using Polarization Encoding Over Optical Fibers."
- October 27, 2015: "Development and Implementation of a Versatile Real-Time Traffic Monitoring System Using Wireless Smart Sensors Networks."
- November 3, 2015: "Multi-Photon Tolerant Approach for Satellite Communications."

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CONFERENCE REPORT

First IEEE Convention of Electrical & Electronics Engineering Students in Israel

An Overview of the Activities of the IEEE Comsoc Israel Chapter

By Yiftach Richter, ComSoc Student Member, Israel,
and Itsik Bergel, ComSoc Senior Member and Head of
Student Activities of the IEEE Israel Section

First IEEE Convention of Electrical & Electronics Engineering Students

Israel is well known for its label as the startup nation, and engineering at Israeli universities is flourishing as well. However, so far IEEE student members have had very few organized activities. This dramatically changed this year at the First Convention of Electrical & Electronics Engineering Students in Israel (IEEEIs 2015). IEEEIs 2015 was held at Bar-Ilan University, Ramat-Gan, and featured keynotes, oral presentations, poster sessions, and a job fair.

The convention targeted mostly graduate students, and gave them an opportunity to present their research in a professional yet casual environment. The convention was also a platform for meetings and exchanges of ideas between students and between students and senior researchers. The job fair also focused on graduate students, and featured leading high-tech companies. As an example, one of the participating companies, Mellanox LTD, offered more than 50 positions.

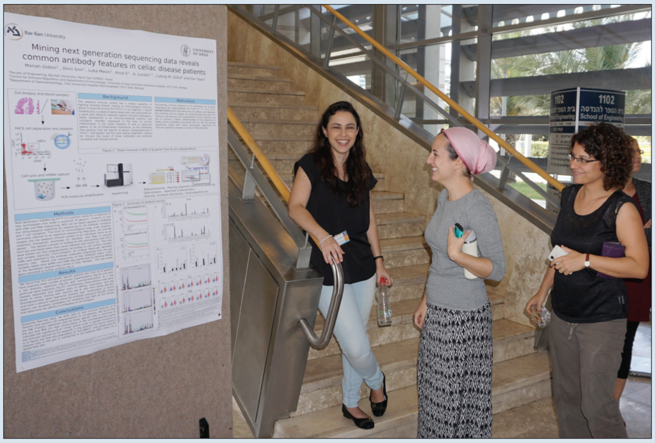
As appropriate to an Israeli student conference, all keynotes were startup oriented (which also attracted B.Sc. students). Rafi Nave, a leading Israeli hi-tech entrepreneur and manager of the Entrepreneurship Center at the Technion, presented a talk titled "Hi-Tech Nation." In his talk Mr. Nave surveyed that main strengths that made Israel a hi-tech nation, and pointed out that more than 50 percent of the GDP of Israel comes from the hi-tech industry.

The second keynote, titled "Photonic Ear for Remote Detection and Diagnostic of Diseases," was presented by Prof. Zeev Zalevsky, the vice dean of the Faculty of Engineering at Bar Ilan University. Prof. Zalevsky presented a few of his cutting-edge innovations involving the development of a laser based technology allowing remote and continuous sensing of nano vibrations of different tissues. The translation and analysis of the nano vibrations can be used for the detection of various diseases, as well as for establishing a very directional and noise immune sound-communication channel. The realization of the above mentioned capabilities is obtained by proper image processing of the time-space varying secondary speckle patterns generated by the back reflection of the laser light from the inspected tissue.

The convention was closed by a keynote by Dr. Akihiko Sugiyama, who is an IEEE distinguished lecturer on signal processing. The talk, titled "What I Wish I Knew When I was an Entry-Level Engineer," compiled Dr. Sugiyama career experience into a useful guide to the starting engineer.

Most importantly, between the keynotes, IEEE student members had an opportunity to present their novel research in eight poster and oral sessions. These sessions covered all topics of electrical and electronics engineering, including communication, signal processing, information theory, electro-optics bio-engineering, and more. Merav Passig-Antman, an IEEE student who presented her work at the convention, said, "I was greatly excited to participate in the IEEEIs convention. The convention was stimulating not only academically but socially as well. Overall, the experience was excellent!"

Attendees networking between sessions.


Attendees discussing one of the poster presentations.

After the great success of the first convention, EE students in Israel are looking forward to the next convention!

Overview Of Activities Of The IEEE Comsoc Israel Chapter

The Israeli IEEE COMSOC chapter supports the CE-Club, a Technion Computer Engineering Club that holds a weekly seminar discussing systems and theory of networking, distributed systems, and more. This club is a joint collaboration of Technion's Computer Science and Electrical Engineering faculties. We meet every Wednesday at 11:30, alternating between both faculties, to hear an interesting research talk. We take a broad view of what constitutes "interesting," both systems and theory of networking, distributed systems, storage, computer architectures, operating systems, compilers, etc.

Our COMSOC members are also invited each year (our 10th year now) to "Israeli Networking Day," which brings together members of the Israeli networking community from both academia and industry to discuss recent developments and research in this vibrant area and to foster new collaborations. The presentations in this event are focused on both published research results and on work in progress. In addition, we invite our members to the CYBERDAY workshop on Cyber and Computer Security in the Computer Science department at the Technion, together with the Technion Computer Engineering center. This workshop has been held since 2008, formerly known as the "CRYPTODAY" workshop.

DISTINGUISHED LECTURER TOUR

Lecture of Andrea Goldsmith at the Nanjing Chapter

By Yueming Cai and Shi Jin, IEEE ComSoc Nanjing Chapter, China

Professor Andrea Goldsmith from Stanford University was invited to give a lecture titled "The Road Ahead for Wireless Technology: Dreams and Challenges" at Southeast University, Nanjing, China on June 26, 2015. The lecture was supported by the IEEE Communications Society Nanjing Chapter and hosted by Prof. Nan Liu from Southeast University. More than 260 people attended this seminar, including academic and research staff, professionals, and students from the IEEE ComSoc Nanjing Chapter.

In the lecture, Prof. Goldsmith presented visions about the future of wireless communications and discussed some innovations and breakthroughs in wireless technologies that are required to realize the visions. First she presented an overview of advanced wireless technologies, which include millimeter wave, massive MIMO, non-coherent massive MIMO, small cell, sub-Nyquist sampling, etc. Then Prof. Goldsmith focused on new advances in green wireless communications. She pointed out that the biggest problem with WiFi and the limitation of small cell is resource contention. She elaborated and explained that the shortage of spectrum could be alleviated by research advances in cognitive radios. Further, she mentioned that breakthroughs in energy-efficiency algorithms and hardware would be employed to make wireless systems "green." Finally, Prof. Goldsmith proposed that most of these research advances are interdisciplinary and a synergistic exploration of knowledge bases from multiple technical domains is required for future research. In the Q&A session, Prof. Goldsmith gave detailed answers to questions about full duplex and the relationship between small cell and D2D techniques. The lecture was very successful and gave audiences a better understanding of green wireless communication and also stimulated their interests in exploring this area.

Prof. Goldsmith during her lecture at Southeast University.

Prof. Goldsmith with members of the IEEE ComSoc Nanjing Chapter.

Andrea Goldsmith is the Stephen Harris Professor in the

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CONFERENCE REPORT

First IEEE International Workshop on Security and Privacy for Internet of Things and Cyber-Physical Systems (IOT/CPS-Security 2015)

ICC2015, London, UK

By Qinghe Du, Eirini Karapistoli, Heath LeBlanc, IEEE IoT/CPS-Security 2015 Workshop Publicity Co-Chairs

The 2015 IEEE International Conference on Communications (ICC) was held in London, UK from 8-12 June. Themed "Smart City & Smart World," this flagship conference of the IEEE Communications Society attracted a record-breaking 2,947 attendees. The technical program of IEEE ICC 2015 consisted of 12 symposia, 27 workshops, 20 tutorials, as well as 18 industry panels. ICC 2015 also featured seven keynote speeches. The First IEEE International Workshop on Security and Privacy for Internet of Things and Cyber-Physical Systems (IOT/CPS-Security 2015) was one of 24 full-day workshops in conjunction with ICC 2015.

IoT/CPS-Security 2015 Keynote Speech by Prof. Wei Yu.

IoT/CPS-Security 2015 Keynote Speech by Dr. Jesús Alonso-Zárate.

Recent advances in networking, communications, computation, software, and hardware technologies have revolutionized the way humans, smart things, and engineered systems interact and exchange information. The Internet of Things (IoT) and Cyber-Physical Systems (CPS), which are the major contributors to this area, will fuel the realization of this new, globally interconnected cyber-world. Yet the success, prosperity, and advancement of IoT and CPS systems strongly depend on the security, privacy, and trust of the IoT and cyber-physical devices as well as the sensitive data being exchanged. While these technologies offer many new possibilities, the increasing complexity of hardware and software as well as

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IOT/CPS Security/*Continued from page 3*

the worldwide access increase the vulnerability to security attacks. Successful attacks targeted to IoT devices and CPS systems have in common that not only a single computer is affected, but also interconnected technical systems allowing interaction with the physical world are influenced leading to malfunction of devices and control systems with severe financial, environmental, and health losses. This fact highlights the need to develop novel tools that will constitute the heart of a much-needed science of security for IoT and CPS and will assist in building resilient, secure, and dependable networked systems. The aim of the IEEE IOT/CPS-Security workshop series, with the first edition in 2015, is to foster a research community committed to advancing research and education at the confluence of cybersecurity, privacy, Internet of Things, and cyber-physical systems, and to transitioning its findings into engineering practice.

IOT/CPS-Security 2015 was a joint effort among active researchers on three continents: Europe, Asia, and North America. Anastasios A. Economides serves as a professor at the University of Macedonia, Thessaloniki, Greece, and the director of the Computer Networks & Telematics Applications (CONTA) Lab. Minho Jo serves as a professor at Korea University, Sejong Metropolitan City, South Korea, and the Editor-in-Chief of *KSII Transactions on Internet and Information Systems*. Houbing Song serves as an assistant professor in the Department of Electrical and Computer Engineering at West Virginia University, Montgomery, WV, USA, and the director of both the West Virginia Center of Excellence for Cyber-Physical Systems (WVCECPS), sponsored by the West Virginia Higher Education Policy Commission, and the Security and Optimization for Networked Globe Laboratory (SONG Lab). Houbing Song is the lead editor of two books, *Cyber-Physical Systems: Foundations, Principles and Applications* and *Security and Privacy in Cyber-Physical Systems: Foundations and Applications*, both of which will be published in 2016 by Elsevier and Wiley, respectively.

The General Chairs of IoT/CPS-Security 2015 were Anastasios A. Economides, University of Macedonia; Houbing Song, West Virginia University; Minho Jo, Korea University; and Daqiang Zhang, Tongji University. The Technical Program Chairs of IoT/CPS-Security 2015 were Krishna Kumar Venkatasubramanian, Worcester Polytechnic Institute; Eirini Karapistoli, University of Western Macedonia; Vasilis Friderikos, King's College London; João Paulo Miranda, Center for Research and Development (CPqD); Dev Audsin, Orange; and Jianguo Ding, University of Skövde.

IoT/CPS-Security 2015 received 49 papers and accepted 12 papers. Papers were submitted from 24 different countries and regions across five continents: North America, Europe, Asia, Africa and Australia.

IoT/CPS-Security 2015 also featured two keynote speeches by Dr. Jesús Alonso-Zárate, who is a senior research associate and the head of the Machine-to-Machine Communications (M2M) Department at the Centre Tecnològic de Telecomunicacions de Catalunya (CTTC), Barcelona, Spain, and Prof. Wei Yu, who is an associate professor in the Department of Computer & Information Sciences at Towson University, Towson, MD, USA. Their talks were entitled "Enabling Autonomous Communications between Machines, Humans, and Things" and "Secure Energy-Based Cyber-Physical Systems," respectively.

Region 5 Activities/*Continued from page 1*

IEEE ComSoc New Orleans Chapter

February: Distinguished Lecturer Tour. Topic: "Realizing FTTH, G-PON is widely adopted, international standards on FTTH, G-PON in particular, have been established and are being further developed." Presenter: Dr. Koichi Asatani, IEEE ComSoc Distinguished Lecturer, IEEE Fellow, IEICE Fellow, Ph.D., lecture professor, Nankai University, Tianjin, China; professor emeritus, Kogakuin University, Tokyo, Japan.

May: Joint Section/ComSoc Chapter Meeting. Topic: "Cellular and Wi-Fi communications systems design that were installed in the Mercedes Benz Louisiana Superdome and Arena prior to the 2013 Super Bowl and the engineering involved with this effort." Presenters: Leo L. Holzenthal, Jr., P.E., ACFE Fellow, president and engineering manager for M S Benbow and Associates; Ken M. Wright, P.E., manager of technology and telecommunications for M S Benbow and Associates.

Conference Coordination: The ComSoc Chapter supported the Section in hosting the IEEE WCNC 2015 conference, as well as the 2015 Region 5 GreenTech Conference in New Orleans.

Distinguished Lecturer Tour/*Continued from page 3*

School of Engineering and a professor of electrical engineering at Stanford University. She is a Fellow of the IEEE and of Stanford, and she has received several awards for her work, including the IEEE Communications Society and Information Theory Society joint paper award, the IEEE Communications Society Best Tutorial Paper Award, the National Academy of Engineering Gilbreth Lecture Award, the IEEE Communication Theory Technical Committee Recognition Award, the IEEE Wireless Communications Technical Committee Recognition Award, the Alfred P. Sloan Fellowship, and the Silicon Valley/San Jose Business Journal's Women of Influence Award. She is author of the book *Wireless Communications* and co-author of the books *MIMO Wireless Communications* and *Principles of Cognitive Radio*, all published by Cambridge University Press. She received the B.S., M.S. and Ph.D. degrees in electrical engineering from U.C. Berkeley.

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Stefano Bregni
Editor
Politecnico di Milano — Dept. of Electronics and Information
Piazza Leonardo da Vinci 32, 20133 MILANO MI, Italy
Tel: +39-02-2399.3503 — Fax: +39-02-2399.3413
Email: bregni@elet.polimi.it, s.bregni@ieee.org

IEEE Communications Society

Stefano Bregni, Vice-President Member Relations
Pedro Aguilera, Director of LA Region
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Wanjiun Liao, Director of AP Region
Curtis Siller, Director of Sister and Related Societies

Regional Correspondents Who Contributed to This Issue

Ewell Tan, Singapore (ewell.tan@ieee.org)

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