

## IEEE CCNC 2013 SHOWCASES INNOVATIVE CONSUMER INFORMATION AND COMMUNICATIONS TECHNOLOGIES TO THOUSANDS OF CONFERENCE & CES 2013 ATTENDEES

The IEEE Consumer Communications and Networking Conference (CCNC 2013) was held on January 11-14, 2013 at the Las Vegas Flamingo Hotel. The conference started on the last day of CES 2013, at which, for the first time, a new, consolidated IEEE booth highlighted innovation and scholarship in various engineering disciplines relevant to consumer electronics. IEEE ComSoc's part of the booth featured selected research prototype demonstration session participants, as well as samples of publications and calls for papers of our conferences, and information on IEEE ComSoc sponsored standards and standardization projects.

Included in the demonstrations at CES was the presentation of Dr. Frank den Hartog of the Netherlands Organization for Applied Scientific Research (TNO), who showed his latest efforts "enabling new e-health business models by converging IP-based and non-IP-based home networks." Designed to overcome the challenge of energy management, education, and e-health services operating with non-IP communication infrastructures, this demonstration revealed how non-IP supporting Continua-certified health devices, such as weighing scales, can be unlocked by Universal Plug and Play (UPnP) systems for use by other devices and services in the home.

In the second demo at the IEEE booth on January 9, Arun Jagatheesan of Samsung R&D Center presented "Application Defined Computing in Smartphones and Consumer Electronics." To overcome the severe energy and performance inefficiencies that accompany the use of commodity components such as NAND Flash memory, this demonstration introduced new memory technologies that can adapt themselves, based on runtime application characteristics, to improve energy efficiency by 23 percent and smartphone performance by 17 percent.

Also at the CES IEEE booth, Dr. Pascal Urien of Telecom ParisTech & EtherTrust addressed "LLCPS: A New Security Framework Based On TLS For NFC P2P Applications In The Internet Of Things," while Dr. David Llewellyn-Jones of Liverpool John Moores University showcased "Prototype for Design-time Secure and Trustworthy Service Composition." The first demonstration presented the Logical Link Control



Protocol (LLCP) secured by TLS and its potential for enabling a wide range of Internet of Things services and Peer-to-Peer (P2P) transactions. The second demo showed design-time prototype software for creating service compositions from different providers, verifying them against security policies, and then making sensible recommendations based on user security preferences, thus reducing the potential for insecure emergent behaviors. Fifteen more high-tech demonstra-

tions were also presented throughout IEEE CCNC 2013 Demonstration Sessions held during the conference venue over the following weekend.

Coinciding with the final day of the International CES, IEEE CCNC 2013 officially opened on Friday, January 11 with a full day of tutorials and workshops dedicated to various consumer-related topics such as "Consumer eHealth Platforms, Services and Applications," "Internet of Things-RFIDs, WSNs and Beyond," "People Centric Sensing and Communications" and "Advances in Home Networking Standardization and Related Research Opportunities." A session was also held on "Emerging Technologies for Future Telecommunications." This latter session highlighted the latest innovations in teleconferencing designed to provide multiple international participants with "high-realism" telepresence experiences by utilizing 3D capture displays, panoramic views, circular microphone arrays, multiple-depth cameras, and facial expression tracking technology.

Other notable sessions included the tutorials presented by Mirrorlink and the Car Connectivity Consortium on "Connecting Smart Phones to Your Car" and Microsoft Research's work on "Erasure Coding: Meeting Three Screens & the Cloud." A highlight of the first was the description of a global collaboration to develop smartphone-based connected car solutions that use smartphones as the main user interface for in-car infotainment experiences and applications. The Microsoft Research tutorial described erasure coding's key role in improving network performance and reducing cloud storage costs related to mass-participant gaming applications over heterogeneous networks.

On Saturday morning, IEEE CCNC 2013 opened with IEEE CCNC Steering Committee Chair Dr. Robert S. Fish of NETovations welcoming all attendees, and thanking this year's IEEE CCNC patrons, which included Samsung, Harman, Microsoft, TNO, EtherTrust, Quby and Aniketos. Technical Program Committee Chair Dr. Jin Li of Microsoft Research also spoke of the program's extensive review process, which resulted in the acceptance of 95 full technical papers out of 313 submissions as well as 47 Work-in-Progress papers.

Following Dr. Li, the Steering Committee Vice-Chair and IEEE ComSoc Vice President-Standards Activities Dr. Alexander Gelman introduced the opening keynote speaker Dr. Donald L. Schilling, Chairman of LINEX Technologies and former President of IEEE ComSoc, who presented his "Vision of Wireless Consumer Communications." Dr. Schilling illustrated the physical similarities between Direct Sequence



Keynote Dr. Donald Schilling addressed attendees.

and Frequency Hopping Spread Spectrum mechanisms and Multi-Carrier OFDM. He pointed out that “OFDM appears today to be the best Spread Spectrum technique” as well as the significant benefits of deploying MIMO in conjunction with Spread Spectrum/OFDM systems in order to mitigate the negative effects of channel fading and multipath, while increasing system capacities. Dr. Schilling envisions further improvements in wireless communications, e.g. migration to smaller cell sizes and wide deployment of mesh networks. His profound message to young engineers and scientists was “Whatever you think of doing, can be.”

After the opening keynote, the conference’s technical and business program started. Over the next three days more than 100 technical papers, demonstrations, and Work-in-Progress sessions featured topics like “Robust Wearable Health Monitoring Systems,” “Audiovisual and Haptic Interactive IP Communications,” “Energy Efficient Green Cellular Networks,” “Multihop Vehicle-to-Vehicle Communications Over TV White Spaces” and “Real-Life Applicable Fall Detection Systems.” In addition, there were sessions on “Clustering and Mesh Networks,” “Channel-adaptive Sensing for Cognitive Radio Networks,” “Intelligent and Emotion-oriented Computing” and “Social Networking Security.”

In the afternoon session, General Chair Dr. Eunsoo Shim of Samsung Electronics introduced the conference’s second keynote speaker, Dr. Kilsu Eo, Senior Vice President of Samsung. Dr. Eo detailed his company’s view of “Smart Life with Convergence” and its goal of deploying cloud services, data analytics, web-centric solutions and convergence platforms in order to advance the everyday use of consumer electronic devices, future cars, and health care devices. He spoke of how smart phones and TVs have changed from stand-alone devices to integrated systems that can provide new user experiences. Dr. Eo suggested that “in order to compete in the market, device manufacturers must find a way to provide differentiated experiences to users. Samsung sees the solution is in technology convergence (in which) previously separate devices, networks, and services now converge to offer new, exciting applications and user experiences.”

On Sunday morning, Dr. Li opened the day by welcoming the third keynote speaker, Albert Greenberg, Partner Development Manager of Microsoft, who presented on “SDN in Windows Azure Cloud” and the “real world” problems of achieving reliability and scale of operations for a large public cloud. Among his multi-tenancy and virtualization recommendations were the need for automated network management solutions integrated with cloud infrastructures, network functions involving load balancing, standards-based network management, and SDN technology advances that enable more agile, simple, reliable, inexpensive and scalable networks.

The IEEE CCNC 2013 Banquet held Sunday evening featured the keynote of Dr. I.P. Park, Executive Vice President & CTO of HARMAN International, who addressed “Game Changers of Future Consumer Communications.” Dr. Park focused on the core concepts of big data, smart connectivity, and the impact of rapid pace technological changes on user experiences. He pointed out that 25 years ago mainframe computers rapidly succumbed to compact desktop devices and the world enjoyed exponentially multiplied available processing power per user. Today, we are in the middle of a far more dramatic paradigm shift in Information and Communications Technologies (ICT). The shift is occurring because of the mass proliferation of mobile devices and applications and the deployment of cloud services. He emphasized that HARMAN’s vision for the future must include leveraging these latest technological trends for consumer audio/visual and



*Mónica Alejandra Lora presented her demo to Rob Fish.*

infotainment products and services.

Other banquet highlights included the presentation of this year’s best paper and innovation awards, which honored:

- Yutaka Ihara, Haris Kremo, Onur Altintas and Hideaki Tanaka of the Toyota InfoTechnology Center, Japan; Masaaki Ohtake and Takeo Fujii of the University of Electro-Communications, Japan; and Chikara Yoshimura, Keisuke Ando, Kazuya Tsukamoto, Masato Tsuru and Yuji Oie of the Kyushu Institute of Technology, Japan with the Best Conference Paper Award for their paper titled “Distributed Autonomous Multi-Hop Vehicle-to-Vehicle Communications over TV White Space.”

- Dizhi Zhou and Wei Song of the University of New Brunswick and Minghui Shi of Industry Canada with the Best Student Paper Award for “Goodput Improvement for Multipath TCP by Congestion Window Adaptation in Multi-Radio Devices.”

- Yiqun Yang and Chai Kiat Yeo of the Nanyang Technological University, Singapore with the Honorable Mention for Innovation for “Design and Analysis of a Cluster-based Calcium Signaling Network Model.”

- Eyal Toledano, Dan Sawada, Andrew Lippman, Henry Holtzman and Federico Casalegno of MIT with the Best Demonstration Award for the “CoCam: Real-time Photo Sharing Based on Opportunistic P2P Networking” research prototype demonstration.

- Mónica Alejandra Lora, Alexander Paulus, and Klaus Wehrle of the RWTH Aachen University, Germany with an Honorable Mention Demonstration Award for “Improving Associations in IEEE 802.11 WLANs” research prototype demonstration.

In addition, Robert Hemsley, Dan Sawada and their Fling-It application were named the first place winners of the TouchDevelop Challenge held during the Touch of Genius Workshop on Sunday. This included the on-site development of scripts written specifically for the TouchDevelop programming environment that runs on mobile devices. Also honored with a second place finish was Jeevan Pokhrel for Hungry Rabbit and earning a third place award was Yuhuan Du for RemoteBoard.

IEEE CCNC 2013 concluded on Monday, January 13 with tutorial and Work-in-Progress sessions focused on topics such as “Vehicular Networking: Applications, Standards, Protocols, Deployment Plans and Open Issues,” “Smart Switch: Opti-

mize for Green Cellular Networks,” “Mainstream Media vs. Social Media for Trending Topic Prediction” and “Improved Feature Representation for Robust Facial Action Unit Detection.”

For information on the 10th Annual IEEE Consumer Communications & Networking Conference, including links to the event’s Facebook, LinkedIn and Twitter sites, visit <http://www.ieee-ccnc.org/2013>. Planning is also underway for IEEE CCNC 2014 to be held January 10 – 13, 2014 in Las Vegas, Nevada, USA. Please feel free to access <http://www.ieee-ccnc.org/2014> for ongoing updates as well as “Call for Papers” submission guidelines and deadlines.