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CONFERENCE REPORT

Report of the Opto-Electronics and Communications Conference (OECC) 2015

By Xinwan Li, TPC Co-Chair of OECC2015, and Kan Wu, General Secretary of OECC2015, Shanghai Jiao Tong University, China

The OptoElectronics and Communications Conference (OECC) is one of the biggest worldwide conferences focused on the latest optical and photonic research areas. OECC 2015 was held in the Shanghai Everbright Convention Center, Shanghai, China, from June 28 to July 2, 2015. The conference provided a platform for researchers from around the world to share their latest research advances, promoting international collaboration.

The conference was sponsored by the IEICE Communications Society, the IEEE Photonics Society, the IEEE Photonics Society Shanghai Chapter, the IEEE Communications Society Shanghai Chapter, the China Institute of Communications, and the Optical Society of Korea.

There were 470 submissions in total, including 327 contributed submissions from 33 countries or regions around the world. A total of 205 papers were accepted, for an acceptance ratio of 62.7 percent. Each paper was reviewed by at least three peer reviewers. There were 152 oral presentations, 124 invited presentations, and 53 poster presentations, arranged into eight categories, two symposia, and two workshops, listed below.

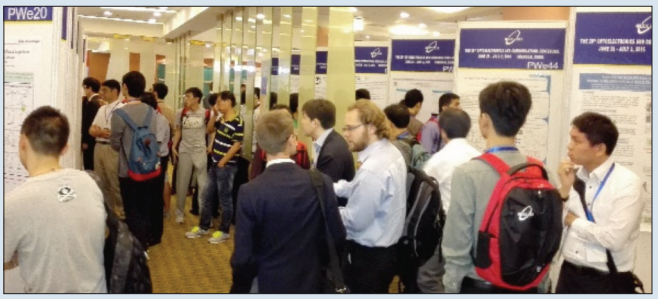
CATEGORIES
C1 Optical Transmission Systems and Subsystems
C2 Optical Networking and Switching Technologies
C3 Optical Fibers, Cables, Devices, and Modules
C4 Optical Fiber Sensors and Microwave Photonics
C5 Laser Technologies and Applications
C6 Micro/Nano Photonic Devices and Integration
C7 Biomedical Optics
C8 Optoelectronic Materials for Communications, Display, and Energy

SYMPOSIA
S1 Optical Wireless Communications
S2 Frontier in Stimulated Brillouin Scattering
S3 Design and Fabrication Technology for Photonics Electronics Convergence
S4 Hybrid Nanophotonics

WORKSHOPS
W1 Optical Sampling and Photonic Analog-to-Digital Converters
W2 Photonics of Two-Dimensional Materials

Two workshops were organized in the afternoon of June 28. The opening ceremony was organized in the morning of June 29, followed by three plenary presentations. The first plenary presentation was given by Prof. B. Jalali from UCLA on the topic of 'Optical Information Capacity of Silicon'. The second plenary presentation was given by Dr. Atsushi Takahara from NTT Network Innovation Laboratories on the topic 'Next Challenges with Virtualization of Network Infrastructure'. The third plenary presentation was given by Prof. Chao-Yang Lu from the University of Science and Technology of China on the topic 'Recent Experimental Progress in Quantum Information Processing with Photons and Cold Atoms'.

Plenary presentation.



Poster session.

In the technical sessions, there were 64 parallel oral sessions and one poster session during the conference period. Among 64 oral sessions, there were 10 symposia sessions covering the topics of optical wireless communications, stimulated Brillouin scattering, photonics electronics devices and nanophotonics.

The post deadline paper (PDP) presentations were organized on the evening on June 30. Four post deadline papers were accepted after the revision of technical committee members. They were "Record Field Demonstration of C-band Multi-Terabit 16QAM, 32QAM and 64QAM over 762km of SSMF" by Rahman, Coriant R&D GmbH, Germany, "What is the True Value of Dynamic Optical Path Switching?" by Kurosu, NIAIST, Japan, "First Demonstration of Holistically-Organized Metro-Embedded Cloud Platform with All-Optical Interconnections for Virtual" by Chen, BUPT, China, and "4–28 Gbaud PAM4 Integrated ROSA with High-Sensitivity APD Datacenter Provisioning" by Nakanishi, NTT Corporation, Japan.

The banquet took place on the evening of July 1. During the banquet, best student papers were awarded to three students. A review of the past 20 OECC conferences by sand painting was made successfully. Chinese traditional Sichuan face-changing was also performed.

(Continued on Newsletter page 4)

CONFERENCE REPORT

6th International FOKUS FUSECO Forum (FFF)

Digital Convergence and Seamless Connectivity for Everyone and Everything: Bringing 5G, SDN/NFV and M2M/IoT Together

By Thomas Magedanz, General Chair, Fraunhofer FOKUS/TU Berlin, Germany

FFF 2015 was the sixth event in the series and attracted approximately 200 telecommunication industry experts and academics from 32 countries. FFF 2015 provided a unique discussion platform for representatives from international network operators, standards development bodies, and leading academic organizations offering two full days of technical tutorials, interactive workshops, conferences, exhibition booths, and live demonstrations.

Tutorials and Interactive Workshops

Day one started with two parallel tutorials followed by three simultaneous workshop tracks. The tutorial 'Network Evolution Towards the 5G Environment' provided an overview of use cases and technology covering the main elements of future 5G technologies: radio, core, management, network function virtualization (NFV), and software defined networks (SDN). The second tutorial provided a detailed perspective on Internet of Things (IoT) and machine-to-machine (M2M), data processing, and cyber-physical systems (CPS) required for the Industrie 4.0, industrial Internet and smart cities.

The first workshop, 'Towards the 5G Environment', was divided into two sessions, one addressing the challenges and requirements for the radio and core network, and the other addressing the latest developments and benefits from network virtualization. The second workshop covered the challenges and requirements of information and communication technologies (ICT) for Industrie 4.0, industrial Internet, and the factories of the future, as well as the enablers for ICT within the industrial environment. The third workshop addressed the evolution of IoT and M2M platforms and services for different vertical domains. The benefits of both platform types were analyzed, and it was clear at the end of the workshop that they are key enablers for smart solutions and applications. Innovative M2M and IoT solutions and applications were also analyzed and discussed.

Conferences and Panel Discussions

On the second day the different tracks of the previous day were united under the main theme of this year's FFF by a full day conference entitled '5G Starts Now – Putting the Building Blocks for 5G Together', which consisted of four sessions. Each session was preceded by presentations from various international network operators, vendors, academics, and standardization bodies, concluding with a panel. The topics were: 'The Evolution Path to 5G, Including Radio, Core and Management Networks'; 'The Impacts of SDN and NFV on the Telecom Industry'; 'M2M, IoT and Data as Key Communication Drivers around the World'; and 'CPS: Driving Factories of the Future'.

Prof. Dr. Thomas Magedanz opening the IoT, M2M and Industrial Internet tutorial.

Live demonstration based on the Fraunhofer FOKUS Open5G-MTC Toolkit. Virtualization meets M2M/IoT.

Panel discussion on SDN and NFV.

With respect to 5G it was agreed that for its investment it is important to identify the best ways to monetize the technology and that investment in 5G should be targeted on enhancing the end user experience. This can only be achieved by the convergence of the different access methodologies. Openness will be one of the most important characteristics of the upcoming technology as long as it enables easy connectivity to APIs and innovative services.

Concerning SDN and NFV, standardization is one of the key challenges that needs to be addressed, especially with respect to interoperability and network management. According to the experts, the main purpose of standardization is to avoid proprietary solutions and enhance interoperability. The panel also indicated that important organizational changes and impacts need to be evaluated.

Regarding IoT, it was agreed that it enables the Internet of People and that entrepreneurs will benefit from it. IoT might be deployed without human presence, but it will require coverage. Therefore, coverage will become critical. Usability of the IoT technology for the end user, network simplification and life cycle management for IoT products will also be essential. Security, openness to service providers, and the resolution of data ownership also need to be added to the list.

With respect to best practices in smart cities and Industrie 4.0 communications, the participants agreed on the importance of analytics, connectivity, and low latency to enable digital manufacturing.

Live Demonstrations

Alongside the workshop seven live demonstrations were made. The following technologies and technical challenges were addressed: core networks, next generation M2M connectivity and mobile edge integration in a single solution; secure connectivity for the industrial environment; cost efficient edge-cloud solutions; hands-on examples of product prototyping using NFV and SDN technologies; interconnection of virtual and physical ecosystems in the industrial Internet; combination and integration of multi-da-

(Continued on Newsletter page 4)

CHAPTER REPORT

Activities of the Xi'an ComSoc Chapter

By Prof. Bin Song and Prof. Rong Sun, State Key Lab of Integrated Services, Xidian Univerisity, Xi'an, 710071, China

During the past half year, the Xi'an ComSoc Chapter arranged several seminars for students and young members. The discussion topics were mainly about wireless communications, electronic healthcare, communications security, and so on.

In addition to the seminars, we also invited three Distinguished Lecturers to conduct lectures for the students and young scholars.

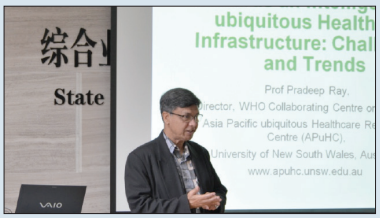
On May 15, 2015, IEEE Distinguished Lecturer Prof. Nei Kato from the Tohuko University, Japan gave a lecture on 'Device-to-Device (D2D): Research Trends and Future Perspectives' to the students. More than 30 students and teachers attended the lecture.

Prof. Nei Kato in lecture.

Distinguished Lecturer Prof. Nei Kato and the students of IEEE Communication Society, Xi'an Chapter.

On June 24, IEEE Distinguished Lecturer Prof. Pradeep Ray from the University of New South Wales, Sydney, Australia gave a lecture on 'Cooperative Service Management in Healthcare Sector: Emerging Trends and Future Challenges' to students and scholars from Xidian University and also to our chapter members.

Prof. Pradeep Ray also visited the study group of Prof. Yang Gang and had a discussion about the issues related to E-Health. The researchers hoped that they can have full collaboration with Prof. Pradeep Ray in the study of E-Health.



Prof. Pradeep Ray in lecture.

Distinguished Lecturer Prof. Pradeep Ray and the Members of IEEE Communication Society, Xi'an Chapter.

On July 6, 2015, IEEE Distinguished Lecturer Prof. Zhu Han from the University of Houston, USA gave a lecture on 'Cooperative Game Theory for Cognitive Radio'. Many students attended the lecture and had good discussions with Prof. Zhu Han.

The students developed many advanced study topics and study methods from those seminars and lectures.

Prof. Zhu Han in lecture.

Distinguished Lecturer Prof. Zhu HAN and the members of IEEE Communication Society, Xi'an Chapter.

SISTER SOCIETY NEWS

Geo2Tag: The Advanced Open Source Ecosystem for LBS Developers

By Mark Zaslavskiy, Kirill Krinkin and Sergey Balandin, Geo2Tag LBS Platform Development Team, FRUCT Ltd.

This review presents the new opportunity for research and developer teams working on LBS-enabled solutions and Internet of Things infrastructure. Geo2Tag is the world's most popular open source LBS platform[1]. Recently the IEEE IoT technical team listed Geo2Tag as a platform for making IoT solutions in city tagging scenarios[2].

The Geo2Tag platform enables simultaneous work on multiple different services and seamless creation of new services without server reloads. The platform provides a sophisticated spatiotemporal API for the services, which allows geo-fencing with altitude support, date/time filtering (including support of BC dates), data aggregation and visualization, and so on. At the same time service creation on Geo2Tag is an easy and cozy process, and developers have access to the large library of templates and functions implementing typical functionality. This, plus the use of an open source license, makes Geo2Tag the most cost-efficient and technically best available backend for commercial and non-commercial geo-apps.

Geo2Tag supports Platform as a Service Architecture (PaaS). It uses virtualization instruments such as Vagrant and Docker that enable easy integration with a majority of cloud services. The main services provided by the platform are:

•Storage, processing and visualization of spatiotemporal data.

•Simultaneous work on several location-based services inside one instance of the platform.

•Fast content-building startup by importing and pre-processing data from the open databases.

The Geo2Tag data model is as follows. Point is an atomic element of spatiotemporal data. Channel is formed as a set of points. The service is a set of channels. The user is an application or human actor that performs interaction with the platform.

The external interface for LBS developers is provided by REST requests over HTTP. API provides control over spatiotemporal data, geo-fencing functional and administrative actions for a service and the whole platform instance. The spatiotemporal data filtration has several criteria: date and altitude intervals, spatial region, and allowed channel set. All criteria can be applied independently. All REST requests for geo-data support the GeoJSON standard. API authorization is implemented by the use of the OAuth2 protocol.

Geo2Tag provides an API for high performance geo-data visualization and has a special web-service for displaying results of REST queries on a custom map based on a leaflet.js library with changeable map provider. With this solution geo-data elements (points) can be grouped into clusters, which makes data on the map easy to navigate and decreases the volume of used RAM.

Geo2Tag provides an open API for developing third-party plug-ins. A plug-in is an isolated extension for a platform REST API, which can perform background computations on services data and can be turned on and off without server restart. The plug-in

(Continued on Newsletter page 4)

GEO2TAG/*Continued from page 3*

system also contains common interfaces for developing open data plug-ins. These extensions allow the importing and processing of external open access web datasets.

Geo2Tag is used as a platform for various apps and use cases[3]. As an example, the Open Karelia museum system (www.openkarelia.org) networks a number of museums in Russian and Finnish and provides a common set of e-Tourism services. Other examples of Geo2Tag based services are: nearest doctor search, tracing public transport, car fleet services, and personal tracker.

Future development of Geo2Tag is focused on improving the usability of the REST API, getting more LBS developers on board. We continuously work to further improve mobile power consumption and performance and increase usability. More content is made available to developers via the API and plug-ins. We welcome you to start using Geo2Tag by visiting www.geo2tag.com, or contacting us via email (Mark.Zaslavskiy@fruct.org, Kirill.Krinkin@fruct.org, Sergey.Balandin@fruct.org).

[1]MetricsKey rating http://metricskey.com/open/open-source-location-based-services/ + is the 2nd in Google for "LBS platform" (after TomTom)

[2]The reference is at the bottom of the first page in PDF http://iot.ieee.org/iot-scenarios.html?prp=6.

[3]E. Balandina, S. Balandin, Y. Koucheryavy, and D. Mouromtsev, "IoT Use Cases in Healthcare and Tourism," *Proc. 17th IEEE Conf. Business Informatics (CBI 2015)*, Lisbon, Portugal, July 13–16, 2015. pp. 37–44.

OECC 2015/*Continued from page 1*

OECC 2015 was concluded with great success. A total of 470 submissions were obtained for the TPC to review. Among those submissions, the three largest submission totals by country/region were from mainland China, Japan, and the United States. Finally, 403 participants, including 206 non-Chinese nationality participants (~51%), participated in the conference this year. Three plenary talks, 124 invited presentations, 152 oral presentations, and 53 poster presentations were arranged. Four PDP presentations were selected; however, this year there were six no-show presentations, including two poster presentations.

OECC/PS 2016, to be held in Toki Messe, Japan, was promoted to all participants on July 1, 2015, a fantastic banquet night in Shanghai!

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FOKUS FUSECO FORUM/*Continued from page 2*

ta sources in an interoperable manner; and the combination of computer vision with cyber-physical systems for industrial purposes.

All demonstrations were based on the newest testbed toolkits from Fraunhofer FOKUS, namely Open5GCore (www.open5GCore.org), OpenSDNCore (www.openSDNcore.org), Open5GMTC (www.open5GMTC.org), OpenMTC (www.openMTC.org), 5G Playground (www.5G-playground.org), as well as the recently launched OpenBaton (www.openBaton.org), an open source ETSI NFV MANO Orchestrator.

CONCLUSION

Key takeaways of the event were:

•5G is not limited to the next generation of mobile communications, but is accompanied by a paradigm shift regarding softwarization and mobile-fixed convergence.

•Softwarization is the major innovation and the change is taking place today.

•SDN/NFV and network slicing are the enabler technologies for the transformation of the network infrastructure.

•Programmable platforms allow for the rapid introduction of new services and business agility.

•Outstanding business drivers will be the vertical markets, mainly the industrial Internet.

OUTLOOK: FOKUS FUSECO FORUM 2016

Based on the global relevance of the addressed topics and technologies, and following the continued success of the FOKUS FUSECO Forum series in the past, the 7th FUSECO Forum is planned for mid-November 2016 in Berlin, Germany. For more detailed information, please refer to: www.fuseco-forum.org

OMBUDSMAN

ComSoc Bylaws Article 3.8.10

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