IEEE Communications Society Distinguished Lecturer Tour Europe, Middle-East, & Africa Region in June 2015

Prof. Jianwei Huang

As an IEEE Communications Society (ComSoc) Distinguished Lecturer, I was honored to be invited to give three lectures at ComSoc chapters in Barcelona (Spain), London (UK), and Cambridge (UK) during May 30 to June 8, 2015.

1. Barcelona, Spain

My first stop was Barcelona. The visit was arranged by ComSoc Spain Chapter Chair Prof. Víctor P. Gil Jiménez (http://www.tsc.uc3m.es/~vgil/). The local host was Dr. Miquel Payaró (http://www.cttc.es/people/mpayaro/), who is a Devision Head from CTTC (Centre Tecnològic Telecomunicacions Catalunya, http://www.cttc.es/).

The title of my lecture was "Mobile Data Offloading". The research discussed in this lecture is motivated by the unprecedented worldwide growth of mobile data traffic. However, traditional network expansion methods by acquiring more spectrum licenses, deploying new macrocells, and upgrading technologies are costly and time-consuming. Clearly, network operators must find novel methods to resolve the mismatch between demand and supply growth, and mobile data offloading appears as one of the most attractive solutions. Mobile data offloading is the use of complementary network technologies, such as WiFi and femtocell, for delivering data traffic originally targeted for cellular networks. In this talk, we surveyed the opportunities and challenges of mobile data offloading, and introduced our recent results on the design of optimal delayed offloading protocols and offloading market mechanisms. This is a shorter version of a three-hour tutorial that I gave in ICC 2014 and ICC 2015 (http://jianwei.ie.cuhk.edu.hk/Files/MDO-Tutorial.pdf). More information on our research in this area can be found at http://ncel.ie.cuhk.edu.hk/content/wifi-data-offloading.

My lecture in Barcelona was chaired by Dr. Miquel Payaró and attended many colleagues from CTTC. The number of attendees was around 30. It was also streamed in real time to other local chapters in Spain, through the kind arrangement of Prof. Víctor P. Gil Jiménez and Dr. Miquel Payaró. The attendees asked many excellent technical questions during and after the lecture.

I had a chat with the CTTC Director, Professor Miguel Ángel Lagunas, before my lecture. After the lecture, I visited several research labs of CTTC, including the communication technology lab headed by Dr. Miquel Payaró. CTTC is a non-profit research institution based in Castelldefels (Barcelona), resulting from a public initiative

of the Regional Government of Catalonia (Generalitat de Catalunya). Research activities at the CTTC, both fundamental and applied, mainly focus on technologies related to the physical, data-link and network layers of communication systems, and to the Geomatics. CTTC has an impressive record of R&D, and has been very active in many European projects. Later on I had the lunch with Dr. Miquel Payaró, at one of the local restaurants near the beautiful beach of Castelldefels. The food was great too. I learnt much regarding the current status of telecom industry and academia in Spain during the lunch.

2. London, UK

After departing Barcelona, my second stop was London, UK. The lectures in UK (both in London and Cambridge) was supported by ComSoc UK Chapter, through the kind coordination of Prof. Wai Pang Ng (https://www.northumbria.ac.uk/about-us/our-staff/n/wai-pang-ng/), who is the Past Chair of ComSoc UK/Ireland Chapter. My local host was Prof. Kin Leung (http://www.commsp.ee.ic.ac.uk/~kkleung/), who is the Tanaka Chair Professor and Head of Communications & Signal Processing Group at Imperial College.

I again gave the lecture on "Mobile Data Offloading". The lecture information can be found at http://talks.ee.ic.ac.uk/talk/index/736. The lecture was chaired by Prof. Kin Leung, and was attended by Prof. Wei Dai, Prof. Deniz Gunduz, and some research students. Overall the number of audience was around 15. My department colleague Prof. Angela Zhang also visited Prof. Kin Leung on that day and joined my research seminar. After the lecture, we had the lunch together in the Imperial faculty club, and discussed various academic issues in UK and worldwide.

3. Cambridge, UK

The last stop of my DLT was Cambridge, UK. My hosts were Prof. Frank Kelly (http://www.statslab.cam.ac.uk/~frank/), Prof. Richard Gibbens (http://www.cl.cam.ac.uk/~rg31/), and Prof. Felix Fischer (http://www.statslab.cam.ac.uk/~ff271/). Prof. Frank Kelly is Professor of the Mathematics of Systems in the University of Cambridge, and Master of Christ's College, Cambridge. Prof. Richard Gibbens is a Reader in Network Modeling in the Computer Laboratory of University of Cambridge, and a Fellow of Gonville and Caius College, Cambridge. Prof. Felix Fischer is a lecturer in the Statistical Laboratory of the University of Cambridge and a fellow of King's College, Cambridge.

My lecture was part of the Optimization and Incentives Seminar series at Cambridge University. The lecture information can be found at http://talks.cam.ac.uk/talk/index/59009, and the series information can be found at http://talks.cam.ac.uk/show/archive/9942. The research discussed in this lecture is motivated by the proliferation of advanced mobile devices, which leads to the emergence of user-provided networks (UPNs). UNP improves user experiences by exploiting the diverse communication needs and resources of different users. The success of UPNs, however, relies on carefully designed incentive mechanisms that effectively encourage voluntary participation and cooperation of users. Motivated by recently launched UPN business models, in this lecture we introduced two new mobile UPN incentive mechanisms that take users' energy consumption and data usage costs into consideration. The first one is motivated by the social bandwidth trading scheme pioneered by Karma, and we design an optimal hybrid pricing scheme that combines usage-based data pricing and quota reimbursement for network-assisted mobile UPNs. The second one is motivated by the crowd-sourced Internet connectivity enabled by OpenGarden, and we design a virtual currency based scheme that incentivizes cooperation in autonomous mobile UPNs. For more information, please see http://ncel.ie.cuhk.edu.hk/content/user-provided-networks. A three-hour tutorial on this topic will be given in IEEE GLOBECOM 2015 on December 10, together with Leandros Tassiulas from Yale University (http://globecom2015.ieee-globecom.org/content/tutorials).

My lecture was chaired by Prof. Felix Fischer, and I was introduced by Prof. Frank Kelly. Several other colleagues from Cambridge University, including Prof. Richard Weber, also joined the lecture. After the lecture we had a long technical discussion with the hosts and audience, while enjoying the nice English tea and cookies. Prof. Frank Kelly and Prof. Richard Gibbens also shared with me a closely related paper that they published quite some time ago. It was very nice to hear a different perspective of the problem. Then Prof. Frank Kelly and Prof. Richard Gibbens gave me a brief tour of the Faculty of Mathematics of Cambridge University. Finally, I signed THE Visitor Logbook of the faculty, which was signed by many visitors during the past several decades, including many well known theoreticians in history.

Acknowledgments

Jianwei Huang, Ph.D., IEEE Senior Member
Associate Professor, Department of Information Engineering
The Chinese University of Hong Kong

DL Biography: Jianwei Huang is an Associate Professor and Director of the Network Communications and Economics Lab (ncel.ie.cuhk.edu.hk), in the Department of Information Engineering at the Chinese University of Hong Kong. He received Ph.D. from Northwestern University in 2005, and worked as a Postdoc Research Associate at Princeton University during 2005-2007. His main research interests are in the area of network economics and games, with applications in wireless communications, networking, and smart grid. He is a Senior Member of IEEE, and a Distinguished Lecturer of IEEE Communications Society (2015-2016).

Dr. Huang is the co-recipient of 8 Best Paper Awards, including IEEE Marconi Prize Paper Award in Wireless Communications in 2011, and Best (Student) Paper Awards from IEEE WiOpt 2015, IEEE WiOpt 2014, IEEE WiOpt 2013, IEEE SmartGridComm 2012, WiCON 2011, IEEE GLOBECOM 2010, and APCC 2009. He received the IEEE ComSoc Asia-Pacific Outstanding Young Researcher Award in 2009. He has co-authored four books: "Wireless Network Pricing," "Monotonic Optimization in Communication and Networking Systems," "Cognitive Mobile Virtual Network Operator Games," and "Social Cognitive Radio Networks". He has co-authored five "ESI Highly Cited Papers," which are among the top 1% papers in terms of citations within the field of Computer Science according to Web of Science.

Dr. Huang has served as an Editor of IEEE Transactions on Cognitive Communications and Networking (2015-), Editor of IEEE Transactions on Wireless Communications (2010-2015), Editor of IEEE Journal on Selected Areas in Communications - Cognitive Radio Series (2011-2014), Editor and Associate Editor-in-Chief of IEEE Communications Society Technology News (2012-2014), and Editor-in-Chief of IEEE ComSoc TCCN Communications (2015-). He has served as a Guest Editor of IEEE Transactions on Smart Grid special issue on "Big Data Analytics for Grid Modernization" (2016), IEEE Network special issue on "Smart Data Pricing" (2016), IEEE Journal on Selected Areas in Communications special issues on "Economics of Communication Networks and Systems" (2012) and "Game Theory in Communication Systems" (2008), and IEEE Communications Magazine feature topic on "Communications Network Economics" (2012).

Dr. Huang has served as Vice Chair (2015-2016) of IEEE Communications Society Cognitive Network Technical Committee, Vice Chair (2010-2012) and Chair (2012-2014) of IEEE Communications Society Multimedia Communications Technical Committee, a Steering Committee Member of IEEE Transactions on Multimedia (2012-2014) and IEEE

International Conference on Multimedia & Expo (2012-2014), Chair of Meeting and Conference Committee (2012-2013) and Vice Chair of Technical Affairs Committee (2014-2015) of IEEE ComSoc Asia-Pacific Board. He has served as the TPC Co-Chair of IEEE WiOpt 2017, IEEE ICCC 2015 Wireless Communications System Symposium, IEEE SDP 2015, NetGCoop 2014, IEEE SmartGridComm 2014 Demand Response and Dynamic Pricing Symposium, IEEE GLOBECOM 2013 Selected Areas of Communications Symposium, IEEE WiOpt 2012, IEEE ICCC 2012 Communication Theory and Security Symposium, IEEE GlOBECOM 2010 Wireless Communications Symposium, IWCMC 2010 Mobile Computing Symposium, and GameNets 2009. He is a frequent TPC member of leading networking conferences such as INFOCOM and MobiHoc. He is the recipient of IEEE ComSoc Multimedia Communications Technical Committee Distinguished Service Award in 2015 and IEEE GLOBECOM Outstanding Service Award in 2010.