



Laboratory for Advanced Research
into Telecommunication Systems



DIIES Dipartimento di
INGEGNERIA
dell'INFORMAZIONE, delle INFRASTRUTTURE,
e dell'ENERGIA SOSTENIBILE

Towards 5G Systems: Current Research Directions

Special topic

Research towards 5G at Chalmers – cooperative, moving and satellite networks

Guest Seminar

Tommy Svensson



CHALMERS UNIVERSITY OF TECHNOLOGY

Special topic

Resource Management in Device-to-Device Cellular Underlay

Guest Seminar

Li Wang



SCHOOL OF ELECTRONIC ENGINEERING
BEIJING UNIVERSITY OF POST AND TELECOMMUNICATIONS

21st October 2015 – 3.00 pm – Aula del Consiglio Ingegneria – 5th Floor

Special topic: **Research towards 5G at Chalmers – cooperative, moving and satellite networks**

The usage of broadband services via mobile devices is becoming increasingly popular. This will become even more important in 5G, when the connected society will make use of bandwidth-demanding services like augmented reality and virtual office applications. To this end, spectrally and energy efficient dense cooperative heterogeneous networks and mmWave based networks are seen as important enablers. In addition, the number of users relying on wireless connections while being inside vehicles are becoming increasingly significant. In this context, future vehicles and transportation systems may play an integral role in wireless networks by providing additional communications capabilities and becoming part of the communications infrastructure to improve capacity and coverage of the cellular network. That is, in order to serve these users effectively, one promising solution is to deploy moving base stations on the vehicles to form moving networks (MNs) that are integrated to the macro network.

Short biography:



Tommy Svensson (S'98--M'03--SM'10) is Associate Professor in Communication Systems at Chalmers University of Technology, where he is leading the research on air interface and wireless backhaul networking technologies for future wireless systems. He received a Ph.D. in Information theory from Chalmers in 2003, and he has worked at Ericsson AB with core networks, radio access networks, and microwave transmission products. He was involved in the European WINNER and ARTIST4G projects that made important contributions to the 3GPP LTE standards, the recently finished EU FP7 METIS project and the recently started EU H2020 5GPPP mmMAGIC project targeting solutions for 5G. His main research interests are in design and analysis of physical layer algorithms, multiple access, resource allocation, cooperative systems, moving networks and satellite networks. He has co-authored two books and more than 120 journal and conference papers. He is Chairman of the IEEE Sweden joint Vehicular Technology/Communications/Information Theory Societies chapter, and coordinator of the Communication Engineering Master's Program at Chalmers.

Special topic: **Resource Management in Device-to-Device Cellular Underlay**

The concept of device-to-device (D2D) communications has recently become one of the popular investigation topics in wireless communications. D2D links can bypass the cellular base-station infrastructure and directly establish peer-to-peer connection. D2D cellular underlay is a specific mode of D2D spectrum utilization that allows D2D links to share spectrum potentially allocated to other cellular terminals. Such a co-channel spectrum utilization improves spectrum efficiency but requires delicate interference control and resource management. In this talk, we first discuss the resource matching problem for D2D resource sharing with existing cellular terminals with the assumption of stable D2D links. Further, we demonstrate the socially enabled resource sharing problem from various perspectives, and elaborate on the social interaction based admission policy for D2D links to guarantee a particular delivery success rate. Finally, we discuss the issues involved in secure D2D transmissions, before providing some related open research problems.

Short biography:



Dr. Li (Liliane) Wang [S'08-M'14] currently serves as an associate professor in the School of Electronic Engineering, Beijing University of Post and Telecommunications (BUPT), where she leads the Lab of High Performance Computing and Networks. Prof. Wang received her PhD degree in 2009 from BUPT. She received 2013 Beijing Young Elite Faculty for Higher Education Award. From December 2013 to January 2015, she held a visiting research position at the School of Electrical and Computer Engineering at Georgia Tech, Atlanta, USA. Currently, she is a visiting researcher of the department of signals and systems at Chalmers University of Technology, Gothenburg, Sweden. Her research interests include wireless networking, secure communications, device-to-device communication systems and peer-to-peer networks. Prof. Wang served on the Technical Program Committees of IEEE CCNC 2009, IEEE CCNC 2010, IEEE WCSP 2013, IEEE GLOBECOM 2014, IEEE WCNC 2015, IEEE ICC 2015, IEEE ICNC 2015, IEEE ICC 2015, IEEE GLOBECOM 2015, IEEE ICNC 2016, IEEE ICC 2016, etc.