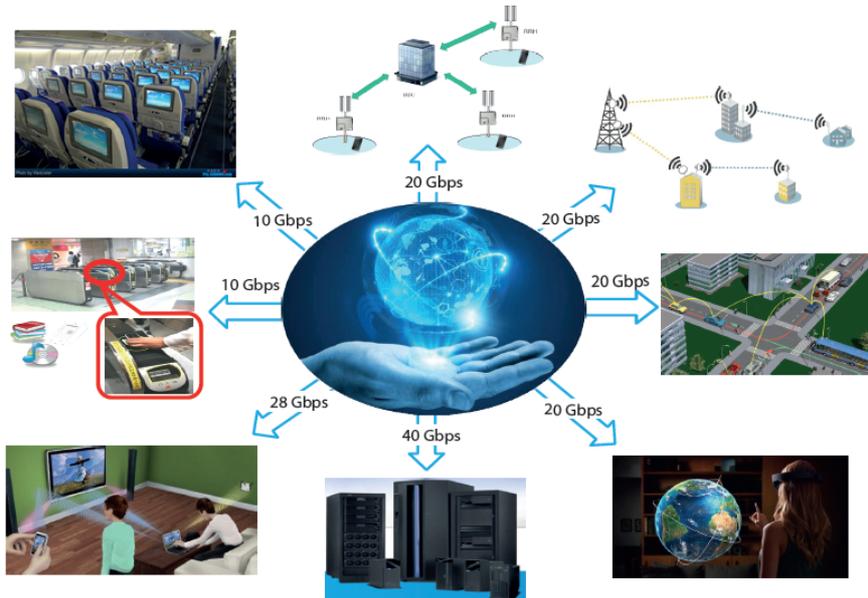


Mini Symposium on Millimeter Waves Networking

June 8th, 14:00-17:00, Room Q31, Osguldas väg 6, 10044 Stockholm
Department of Network and Systems Engineering
KTH Royal Institute of Technology



In future Internet of Things systems, Ad Hoc Networks, and Cellular Networks, the millimeter-wave (mmWave) frequency band will be the key enabler of multigigabit wireless communications. The fundamental differences between mmWave networks and traditional ones challenge the classical design constraints, objectives, and available degrees of freedom. This mini symposium, organized on the occasion of the PhD defense of Hossein Shorkri Ghadikolaei, will give an overview on recent research activities within mmWaves communications from the perspective of Academia, Industry, and Governmental Regulators.

The symposium is free of charge and no registration is needed.

Program

14:10 - *Welcome reception*, Carlo Fischione, KTH Network and Systems Engineering

14:15 – *NR - 5G Radio Access*, Stefan Parkvall, Ericsson Research, Sweden

15:00 – *On System-Level Analysis of mmWave Cellular Networks*, Marco Di Renzo, CentraleSupélec - Univ Paris-Sud, France

15:45 – *Spectrum sharing in 5G*, Federico Boccardi, OFCOM, UK

16:30 – Coffee & pastries

Abstracts and Biographies

NR - 5G Radio Access, Stefan Parkvall

Abstract: 3GPP is currently working on NR, the radio access for 5G. NR will not only provide more efficient support for mobile broadband, it will also support a wide range of other use cases, for example various forms of machine-type communication. Spectrum-wise it will support carrier frequencies from below 1 GHz up to almost 100 GHz, including both licensed and unlicensed spectrum regimes. The first version of the NR specifications is expected by the end of 2017, focusing on mobile broadband and non-stand-alone operation, that is, LTE is used for mobility and initial access. Later versions will support stand-alone operation and full IMT-2020 compliance, addressing the full range of 5G requirements, and will be ready in 2019. This presentation will address some of the technology components behind NR, as well as give an update on the current standardization situation.

Stefan Parkvall (senior member, IEEE) is currently a principal researcher at Ericsson Research working with research on 5G and future radio access. He is one of the key persons in the development of HSPA, LTE and LTE-Advanced radio access and has been deeply involved in 3GPP standardization for many years. Dr Parkvall is a senior member of the IEEE, served as an IEEE Distinguished lecturer 2011-2012, and is co-author of the popular books “3G Evolution – HSPA and LTE for Mobile Broadband”, “HSPA evolution – the Fundamentals for Mobile Broadband”, “4G – LTE/LTE-Advanced for Mobile Broadband”, and “4G, LTE Advanced Pro and the Road to 5G”. He has numerous patents in the area of mobile communication. In 2005, he received the Ericsson "Inventor of the Year" award, in 2009 the Swedish government's *Major Technical Award* for his contributions to the success of HSPA, and in 2014 he and colleagues at Ericsson was one of three finalists for the European Inventor Award, the most prestigious inventor award in Europe, for their contributions to LTE. Dr Parkvall received the Ph.D. degree in electrical engineering from the Royal Institute of Technology in 1996. His previous positions include assistant professor in communication theory at the Royal Institute of Technology, Stockholm, Sweden, and a visiting researcher at University of California, San Diego, USA.

On System-Level Analysis of mmWave Cellular Networks, Marco Di Renzo

Abstract

This talk is aimed to discuss the critical and essential importance of spatial models for accurate system-level analysis and optimization of emerging ultra-dense and heterogeneous cellular networks. With the aid of stochastic geometry and point process tools, new mathematical methodologies for system-level analysis and optimization will be illustrated. In addition, their application to emerging cellular network concepts will be discussed and validated with the aid of empirical data from publicly available databases. Special attention will be given to the modeling, analysis and optimization of mmWave cellular networks.

Marco Di Renzo received the "Laurea" and Ph.D. degrees in Electrical and Information Engineering from the University of L'Aquila, Italy, in 2003 and 2007, respectively. In October 2013, he received the Doctor of Science degree from the University Paris-Sud, France. Since 2010, he has been a "Chargé de Recherche Titulaire" CNRS in the Laboratory of Signals and Systems of Paris-Saclay University - CNRS, CentraleSupélec, Univ Paris Sud, France. He is an Adjunct Professor at the University of Technology Sydney, Australia, a Visiting Professor at the University of L'Aquila, Italy, and a co-founder of the university spin-off company WEST Aquila s.r.l., Italy. He serves as an Editor of IEEE COMMUNICATIONS LETTERS, IEEE TRANSACTIONS ON COMMUNICATIONS, and IEEE TRANSACTIONS ON WIRELESS COMMUNICATIONS. He is a Distinguished Lecturer of the IEEE Vehicular Technology Society and IEEE Communications Society. He is a recipient of several awards, and a frequent tutorial and invited speaker at IEEE conferences.

Spectrum sharing in 5G, Federico Boccardi

Abstract

In this talk I will present different trends related to spectrum sharing in next generation mobile networks. First, I will discuss the importance of spectrum sharing between different types of applications (e.g. mobile, satellite, fixed links), pushed by the increasing scarcity of spectrum and by the emergence of new enabling technologies. Second, I will discuss the role of spectrum pooling between multiple mobile operators, with focus on mmWave networks. Third, in a world traditionally divided between exclusively licensed and unlicensed spectrum, I will discuss the emergence of hybrid approaches and their application to mmWave. Finally, I will discuss the role of new spectrum access paradigms as enablers for new business models and new services.

Federico Boccardi is a Principal Technology Advisor in Ofcom (the UK communication regulator), where he is leading the technical works within the 5G and WiFi programs. He received the M.Sc and Ph.D. degrees in Telecommunication Engineering from the University of Padova, Italy, in 2002 and 2007 respectively, and the Postgraduate Diploma in Strategy and Innovation from the Oxford Saïd Business School in 2014. Before joining Ofcom, he was with Bell Labs (Alcatel-Lucent) from 2006 to 2013 and with Vodafone R&D in 2014. During his career he held leadership positions in different EU collaborative projects and in the 3GPP standardisation activity for LTE and LTE-Advanced. He received several awards including the 2014 IEEE Globecom Best Paper Award and the 2016 IEEE Communication Society's Fred W. Ellersick Prize. He is an Associate Editor for IEEE on Cognitive Communications and Networking. His current interests fall at the intersection between technology and innovation strategy.