

Recent Research Activities on 5G Technology

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Abstract – This talk will begin with a review of 5G as the next generation of wireless technology which is just three years away from its first commercial service and will move onto a more comprehensive discussion of recent research activities on defining future 5G networks which will incorporate many new technologies such as massive MIMO, small cells, beamforming and mm-waves, and the first phase of standards-based 5G deployments. 5G technology also known as International Mobile Telecommunications 2020, (IMT-2020) will dramatically increase the capabilities of the Internet of Things, Vehicle-to-everything and will pave the way for massive machine-type communications which could support 10^6 devices/km² connection density and 10^7 bps/m² area traffic capacity. This enabling technology for 5G should help wireless networks provide more bandwidth, higher data speeds (up to 2×10^{10} bps peak data rate), 100 Mbps user experienced data rate, lower latency about 1 ms, mobility up to 500 km/hr to many more electronic devices, and help every user to access the same large spectrum available in the same band as a band becomes available in the network and increase the coverage range of base stations within areas of cellular network having low population density. This will require special antenna systems at base-stations and user terminals at frequencies up to 175 GHz in the medium term and above 240 GHz in the long term.



Djuradj Budimir received the Dipl. Ing. and M. Sc. degrees in electronic engineering from the University of Belgrade, Belgrade, Serbia, and the Ph.D. degree in electronic and electrical engineering from the University of Leeds, Leeds, U.K. In March 1994, he joined the Department of Electronic and Electrical Engineering at Kings College London, University of London, UK. Since January 1997, he has been with the Faculty of Science and Technology, University of Westminster, London, UK, where he is now a Reader of wireless communications and leads the Wireless Communications Research Group. He is also a Visiting Professor with the School of Electrical Engineering, University of Belgrade. He has published more than 300 papers in refereed journals and conference proceedings, four books/book chapters and software's (the book *Generalized Filter Design by Computer Optimization*, ISBN 0-89006-579-9, Artech House Books, March 1998, and the Software and Users Manual *EPFIL-Waveguide E-plane Filter Design* (Artech House, 2000) and a book chapter in *Encyclopedia of RF and Microwave Engineering* (Wiley, 2005) over over 20 Invited papers/lectures, over 20 Seminars/Workshops, one TV program (BBC World Service programme on Microwaves, 17 Nov. 2010) in the field of RF/microwave and millimetre-wave wireless systems and technologies. His expertise includes design of circuits from RF through Microwave to Millimetre-wave frequencies for 4G, and 5G wireless communications, WLAN, wireless sensors, Internet of Things (IoT) and wireless power transfer applications. He serves as an Associate Editor for IET Electronic Letters, He was a local co-chair of European Microwave Conference (EuMW2016), will be a local co-chair of European Antennas and Propagation Conference (EuCAP2018) and member of the TPC of several conferences. He is a Member of the EPSRC Peer Review College, a senior Member of IEEE, a Member of IET and a Chartered Engineer. He has supervised 20 PhD/4 MRes and over 100 MSc theses through to completion and currently supervising 3 PhD theses as the main supervisor (DoS).