

TCCN SIG on Cognitive Radio for 5G

# Kick-Off Meeting



Dr. Markus Mueck, INTEL  
Chairman IEEE SIG

# Welcome to 5G !

## Welcome to IEEE SIG on „Cognitive Radio in 5G“



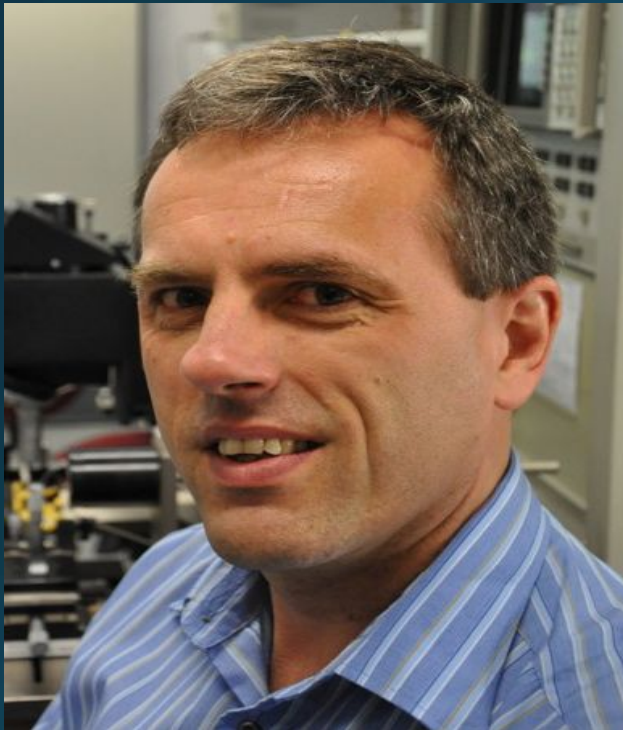
- **Dr. Markus Mueck (Markus.Dominik.Mueck@intel.com)** received the Doctorate degree in Communications of ENST Paris, France in 2006. From 1999 to 2008, Dr. Mueck was Senior Staff member and Technical Manager at Motorola Labs, Paris, France. In this role, he contributed actively to various standardization bodies, namely Digital Radio Mondiale, IEEE 802.11n, etc. and lead the creation of the novel standardization group IEEE P1900.4 in the area of Cognitive Radio and Software Defined Radio (SDR). He also contributed to numerous European Research projects, namely as Technical Manager of IST-E2R II (19 MEuros budget) and as overall technical leader for the definition of IST-E3 (20 MEuros budget). In 2008, Dr. Mueck joined Infineon Technologies, Munich, Germany where he was head of delegation for IEEE 802.16m and transitioned to Intel Mobile Communications in 2011 in the framework of an acquisition by Intel. Currently, he acts as general Chairman of ETSI RRS (SDR and Cognitive Radio Standardization) and is Adj. Professor of Macquarie University, Sydney, Australia. Dr. Mueck has filed over 100 patents, published over 80 scientific conference and journal papers, acts as TPC member of numerous conferences and is involved as reviewer for the evaluation of European Research projects of the European Commission.
- **Key interests for the SIG:**
  - Actively discuss, exchange views and collaborate with experts on state-of-the-art 5G / Cognitive Radio topics;
  - Jointly develop and publish White Papers / Conference & Journal contributions on selected topics;
  - Socialize latest progress / evolutions on political (governmental organizations), regulation (National Regulation Administrations) and standardization activities in all regions ;
  - Organize remote workshops / discussion fora for selected topics.



- **Seungwon Choi** received the BS degree from Hanyang University, Seoul, Korea, and the M.S. degree from Seoul National University, Korea, 1980 and 1982, respectively, both in electronics engineering, the MS degree (computer engineering) in 1985, and the PhD degree (electrical engineering), in 1988, both from Syracuse University, Syracuse, NY. From 1988 to 1989 he was with the Department of Electrical and Computer Engineering of Syracuse University, Syracuse, NY, as an Assistant Professor. In 1989 he joined the ETRI, Daejeon, Korea. From 1990 to 1992 he was with the NICT, Tokyo, Japan, as a Research Fellow, developing the adaptive antenna array systems and adaptive equalizing filters. He joined Hanyang University, Seoul, Korea, in 1992 as an assistant professor. He is a professor in the School of Electrical and Computer Engineering of Hanyang University. Since 2003, Dr. Choi had been serving as the vice chair for WINNF(Wireless Innovation Forum). He has published nearly 80 SCI-level journal papers and held about 50 patents. His research interests include digital communications and adaptive signal processing with a recent focus on the implementation of the MIMO systems for 5G.
- Key interests for the SIG:
  - The same as Markus'
  - Want to invite you all to Smart Radio Workshop to be held in Hanyang University on November 12, 2014



- **Dr. Guolin Sun** received the B.S., M.S. and Ph.D. degrees all in Telecommunication and Information System from the University of Electronic Science and Technology of China (UESTC), Chengdu, China, in 2000, 2003 and 2005, respectively. Since graduation in 2005, Dr. Guolin has got eight-year industry working experiences on wireless system research and development for LTE, Wi-Fi, Internet of Things (ZIGBEE and RFID, etc.), Cognitive radio, Location and navigation. He worked in Huawei Technologies from 2008 to 2012. He has been involved in 3GPP LTE standards activities, and EU FP7 FARMIR project working on cognitive radio in Huawei Technologies, Sweden. Dr. Guolin Sun has filed over 30 patents, and published over 30 scientific conference and journal papers, acts as TPC member of conferences . Since Aug. of 2012, he has been with the School of Computer Science and Engineering, University of Electronic Science and Technology of China, as an Associate Professor. His general research interest is 5G/2020 oriented wireless network, including cognitive network, software defined wireless networks, network function virtualization.
- Key interests for the SIG:
  - Actively join in discussion, express ideas and collaborate with experts on the way forward for 5G/ Cognitive Radio topics;
  - Jointly develop and publish Papers on the well-known Conference & Journals on selected topics;
  - Collaborate with experts to contribute on standardization activities in all regions , such as ETSI, 3GPP, IEEE;
  - Collaborate with experts to draft project proposals of international cooperation projects on selected topics;
  - Actively join remote workshops / discussion for selected topics.



- **Prof. Eryk Dutkiewicz** received his B.E. degree in Electrical and Electronic Engineering from the University of Adelaide in 1988, his M.Sc. degree in Applied Mathematics from the University of Adelaide in 1992 and his PhD in Telecommunications from the University of Wollongong in 1996. His industry experience includes management of the Wireless Research Laboratory at Motorola in early 2000's. He is currently a Professor of Wireless Communications and the Director of the WiMed Research Centre at Macquarie University, Sydney, Australia. He has held visiting professorial appointments at several institutions including the Chinese Academy of Sciences and Shanghai JiaoTong University in China. His current research interests cover cognitive radio networks and medical body area networks. He is an author of over 170 research papers and several book chapters. He has organised several IEEE conferences in the past 10 years and is the General Chair of IEEE VTC-Spring 2017. He has currently 10 PhD students under his supervision.
- Key interests for the SIG:
  - Actively discuss, exchange views and collaborate with experts on state-of-the-art 5G / Cognitive Radio topics;
  - Jointly develop and publish White Papers / Conference & Journal contributions on selected topics;
  - Organize remote workshops / discussion fora for selected topics.
  - Organise PhD students workshops on 5G/Cognitive Radio at premier IEEE conferences



- Hanwen Cao was born in Sichuan, China in 1983. He received his Bachelor's and Master's degrees from the Beijing University of Posts and Communications (BUPT), China in 2005 and 2008 respectively. From 2006 to 2007, he was with France Telecom R&D, Beijing working on the prototype of MIMO-OFDM and CDMA based SDR platform. In 2012, he received Ph.D. at the Institute of Communication Technology (IKT) in Leibniz University Hannover, Germany. Since November 2012, he has been with the Institute of Digital Signal Processing (DSV) in University Duisburg-Essen, Germany for postdoctoral research in national and FP7 projects on enhancing LTE with cognitive radio. From June 2014, he will join Huawei European Research Center (ERC) and work on 5G wireless technologies. He has published 20+ papers and served as reviewer in several leading conferences and journals in telecommunications and signal processing. His research interests are mainly focused on cognitive radio, Massive MIMO, novel modulations for future wireless communication, radio resource management and prototyping of wireless system with SDR platforms.
- Key Interests for the SIG:
  - Discuss with experts on 5G+CR topics
  - Jointly publish white paper and conference/journal contributions
  - Look for cooperation in research projects
  - Experiments, prototypes and products in the context of 5G



- **Dr. Wei Jiang** received his Ph.D degree in Electrical Engineering from Beijing University of Posts and Telecommunications (BUPT) in 2008. Since then, he has been worked in Huawei Technologies for more than 4 years. Then, he joined institute of digital signal processing (DSV), University of Duisburg-Essen from Sept. 2012, serving as a Task Leader in EU FP7 ABSOLUTE project. He has 20+ publications in flagship international conferences, i.e. IEEE Globecom, ICC, WCNC, PIMRC and VTC. He has 27 patent applications with respect to OFDM, FBMC, beam-forming, space-time coding, MU-MIMO, and cognitive radio, and 10 patents have been authorized in China, Europe, United States, and Japan. He is an IEEE member. His present research interests are in digital signal processing, multiple antennas and cooperative communications.
- Key interests for the SIG:
  - Actively discuss, exchange ideas and collaborate with experts on state-of-the-art 5G / Cognitive Radio topics;
  - Jointly publish papers, organize Special Session and Special Issue on Conference & Journal contributions on selected topics;
  - Jointly propose the research projects in H2020 in the topic of 5G.



TCCN SIG on Cognitive Radio for 5G

# Objectives

# Objectives of the SIG

- Discuss „superhot“ topics and develop an official opinion of the SIG
  - Next event: 1st Remote Workshop on 18-June-2014 (see following slide)
- Drive activities/events at key conferences, workshops, etc.
  - A Workshop proposal was submitted for ICC'15 on „Cognitive Radio in 5G“
  - Proposals for Journals Special Issues, Special Sessions etc. will follow
- Use the SIG as a platform for collaboration on Scientific Publications/ Activities, White Papers, Projects, etc.
  - To start, the joint set-up of White Papers will be discussed at the 1st Remote WS
- **Further suggestions are most welcome 😊**

# 1st Remote Workshop

- The 1st Remote Workshop will focus on “Novel Cognitive Spectrum Usage Paradigms and Mobile Device Reconfiguration” based on Cognitive Radio Technology for 5G.
- We will have invited presentations on the two topics and then a follow-up brainstorming will be organized. The intention is to jointly work on a White Paper (intended to be published on the TCCN Web-Site) in order to communicate views of the SIG. Also, we may identify further means for distributing our views, including for example commonly authored conference or journal paper submissions, special sessions, etc.
- Logistics:
  - Registration: <http://doodle.com/3byxizgdrdnrux6f>
  - The 1st Remote Workshop will be organized remotely using the Lync Screen Sharing and VoIP tool (<https://meet.intel.com/markus.dominik.mueck/7DRBMW7M>). The meeting is scheduled for 9:30am CEST/Paris Time (3:30am EDT (New York, USA), 3:30pm CST (Beijing, China), 4:30pm KST (Seoul, Korea), 5:30pm AEST (Sydney, Australia)) on Wed, 18-June-2014. The duration is limited to 3h

# Workshop proposal for ICC'15

- The SIG leadership team decided to submit a Workshop proposal to ICC'15 on “Cognitive Radio in 5G”
- This Workshop will mainly focus on 5G enabling Technologies and in particular on Cognitive Radio trends and solutions which will play a major role in future 5G heterogeneous Wireless Broadband systems; indeed, a performance increase is targeted of at least a factor 1000x over existing solutions. Commonly agreed key ingredients for achieving the required performance levels and therefore focus topics for the proposed Workshop are as follows: i) New spectrum and spectrum usage paradigms, ii) increased spectral efficiency and iii) base station densification. Those directions will build on advanced decision making capabilities exploiting the availability of related context information – the Cognitive Radio aspect is thus present anytime and everywhere.

# Workshop proposal for ICC'15

- Topics of interest include
  - Spectrum sensing with focus on 5G cellular systems
  - Radio environment map/Geo-location database for 5G cellular systems
  - Cognitive Radio with Massive MIMO for 5G communications
  - Physical layer algorithms for cognitive radio in 5G cellular systems
  - Medium access control for 5G cognitive networks
  - Localization technique in 5G cognitive networks
  - Device-to-device communications in 5G cognitive networks
  - Cognitive technologies in 5G public safety communications
  - Cognitive small cells in 5G cellular systems
  - Test-beds and prototypes for 5G cellular systems
  - Business models, standardizations and regulations for 5G cellular systems
  - Cognitive Radio HetNets in 5G cellular systems
  - Network architectures and evolution of Cognitive Radio for 5G cellular systems

Search...

# WPMC 2014

17<sup>th</sup> International Symposium on  
Wireless Personal Multimedia  
Communications

7-10 September 2014 • Sydney, Australia

## Special Session on CR in 5G

Organised by CR in 5G SIG

## Industry Keynotes on 5G

Intel, Nokia and Huawei

## Tutorials on 5G

Registrations are now open

[www.wpmc2014.org](http://www.wpmc2014.org)

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*King's College London, UK*



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*University of Oulu, Finland*



**Prof. Bruce H. Thomas**  
*The University of South Australia, Australia*



**Dr. David Soldani**  
*Huawei, Europe*

# Further Next Steps

- Suggestion: We jointly initiate a Special Issue, e.g. at
  - IEEE Communications Magazine
  - IEEE Magazine on Wireless Communications
  - Proposal: Discuss Special Issue topics at kick-off meeting @ ICC
- Facilitate cooperation on Conference/Journal Papers
  - Which would be a good format for interactions ?
- Mid-Term: We may issue a book on Cognitive Radio for 5G
- **Further suggestions are most welcome 😊**

We are very much looking forward to a  
fruitful cooperation

