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MINISTRY FOR DEVELOPMENT OF INFORMATION TECHNOLOGIES AND COMMUNICATIONS OF THE REPUBLIC OF UZBEKISTAN

TASHKENT UNIVERSITY OF INFORMATION TECHNOLOGIES (TUIT)

INSTITUTE OF ELECTRICAL AND ELECTRONICS ENGINEERS (IEEE)

International Conference on Information Science and Communications Technologies ICISCT 2016

2nd, 3rd and 4th of November 2016, Tashkent Uzbekistan

Conference Program

Conference Program: 2nd of November

Time	Oral Sessions
8:30 - 9:00	**Opening Remarks**
9:00 - 10:30	**Keynote Speakers- Invited talk** **Title: Profitable Ubiquitous Rural and Remote IoT/M2M/H2H 5G Communications**  **Alexander Markhasin, Professor, D.Sc.(T)** Head of Telecommunication Networks Department Siberian State University of Telecommunications and Information Sciences, Novosibirsk, Russia Email: almar@risp.ru Phone: +7 383 2698383 • Challenges of sparsely populated rural and remote areas of the emerging economics

- Extremely Green & Flexible PHY-MAC Fundamentals
- Spectral and power efficiency optimization and trade-off problems
- Distributed multifunctional MAC, bandwidth resource and QoS/QoE “on the fly” control
- Radically distributed profitable IoT/M2M/H2H 5G grid-like architecture conceptual model

Abstract:
Unacceptably high investments are required into deployment of the optic core infrastructure for ubiquitous wide covering of sparsely populated rural, remote, and difficult for access (RRD) areas using the recent (4G) and also forthcoming (5G) broadband radio access (RAN) centralized techniques, characterized by short cells ranges, because their profitability boundary exceeds a several hundred residents per square kilometer. Furthermore, the unprecedented requirements and new features of the forthcoming Internet of Things (IoT), machine-to-machine (M2M) and also many other machine type IT-systems lead to a breakthrough in designing extremely green flexible and low-cost technologies for future 5G wireless systems which will be able to reach in real time the performance extremums, trade-off optimums and fundamental limits.

We show that the distributed multifunctional medium access control (MFMAC) to long-delay wireless medium is a key technology for rural broadband wireless 5G communications. The improvement of MAC protocols plays a key role in ensuring the extremely green PHY and flexible radio resource & QoS “on the fly” management. Next, the fundamental PHY-MAC throughput limits and extremums of the energy, power, spectral efficiency invariants criteria are proved. The invariant criteria are constructed relying on Shannon m-ary digital channels capacity which riche palette of the technically interpreted PHY-MACs parameters consider. Therefore, the invariant criteria as very suitable for research and design of an 5G extremely performance problems are found. The PHY-MACs smart distributed control techniques which able implements "on-the-fly" the limits close and invariant criterion optimization or trade-off is proposed. Such PHY-MAC’s smart control techniques represent a key disruptive technologies meet the 5G network challenges.

12:00 -2:00	Lunch
Time	**Oral Presentation**
2:00 - 4:00	Session 1: **Optical Communications and Networking OCN and Optical Passive and Active Components and Devices OPA I** Room: A 117 Session Chair: Bakhtiyorjon Rakhimov

2:00 - 4:00	Session 2: **Big Data Analytics and E- and M- Commerce and Delay Tolerant, Fault Tolerant and Reliable Communication** Room: A 125 Session Chair: Dilmurod Davronbekov

4:00 - 4:30	Coffee Break
4:30 - 6:00	Session 3: **Application of Information and Communications Technologies AICT** Room: A 115 Session Chair: Tuygun Nishanbayev

4:30 - 6:00	Session 4: **Optical Communications and Networking OCN and Optical Passive and Active Components and Devices OPA II** Room: A 125 Session Chair: Dilmurod Davronbekov

Conference Program: 3rd of November

Time	Oral Presentation
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10:30 - 12:00	Session 6: **Mobile Communications and Mobility MC and Mobile Ad-Hoc and Sensor Mesh Networks AdHoc, WIMAX, 3G and 4G Systems** Room: A 125 Session Chair: Dilmurod Davronbekov

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12:00 - 2:00	Lunch
2:00 - 3:00	Session 7: **Wireless Communications and Networking** Room: A 125

	Session Chair: Dilmurod Davronbekov

3:00 – 3:30	Coffee Break
3:30 – 5:30	Session 8: **ICT in Education, Research and Science** Room: A 117 Session Chair: Marat Rakhmatullayev

3:30 - 5:30	Session 9: **Military Application of Communications and Information Security MACIS, Architectures, Devices, Security and Privacy ADSP** Room: D 208 Session Chair: Abduxalil Ganiyev

	Invited Dinner

Conference Program: 4th of November

Continental Breakfast

Time	Oral Presentation
9:00 - 5:00	Tutorials Room:

Title: Introduction to 5G and Challenges for Radio Resource Management

Assistant Professor Abolfazl Mehbodniya

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Phone: +81-90-28856608

Abstract: "This talk briefly introduces our JUNO project at Tohoku University, Japan. JUNO project aims at finding solutions for two major issues which are supposed to remain the main concerns of the worldwide research community for at least a decade; (1) Optimization of energy consumption to save the limited energy resources and cope with its increasing demand as well as reducing the worldwide CO2 emission, (2) The need for next generation (5G) mobile communications due to the tremendous trend in increase of data traffic.

Technically speaking, 5G mission is to develop a spectrum- and energy-efficient network which is capable of reaching speeds of 10 Gbps. Specifically, its capability to minimize the energy requirements of web devices and network infrastructure is of utmost importance due to recent concerns for energy consumption in ICT industry. With the rapid growth in the mobile communications sector, the carbon footprint of the ICT sector will grow up to 1.43 Giga-tons by 2020 and mobile communications sector is responsible for 201 Mega-tons of emissions by 2020 (14% of the whole ICT sector). Already, EU targets a 20% reduction in the energy consumption of IT industry by 2020. At the beginning of this talk, we discuss what we have achieved so far by four generations of wireless networks and what we may expect from the upcoming 5G. The newest state-of-the-art proposals and specifications discussed by leading international wireless R&D companies for 5G will then be presented. Later, we introduce the energy-efficiency (EE) issue for wireless communications and infrastructure from different perspectives. These techniques brighten the horizon for 5G system design. In fact, during last decade most researchers have focused on spectrum-efficiency (SE), and EE was not considered by 3GPP as an important performance indicator until very recently. As a result recent wireless standards such as LTE have near optimal SE, with the aid of some advanced techniques such as turbo coding, while they ignore the EE issue. The main problem is how to balance EE and SE metrics in radio resource management (RRM), because they are usually not consistent and sometimes conflict with each other. Finally, we will present some recent energy-efficient RRM modules for 5G Heterogeneous Networks (HetNet). Interference management is one of the main issues of concern in 5G HetNet and RRM module design and will be discussed accordingly."