

W9: Workshop on Non-Orthogonal Multiple Access Techniques for 5G Radio Access Networks

The 5G air interface is targeted to have higher transmission rates, faster access, support of larger user density, and better user experience for enhanced mobile broadband (eMBB) services. Meanwhile, it connects to new vertical industries and new devices, creating new application scenarios such as massive machine-type communications (mMTC) and ultra-reliable and low-latency communications (URLLC) services by supporting massive number of devices and enabling mission critical transmissions with ultra-high reliability and ultra-low latency requirement, respectively. In the study towards 5G air interface standardization, non-orthogonal multiple access (NoMA) is one of the most popular topics with 15 different schemes proposed already. Generally, NoMA can efficiently support higher capacity with greater flexibility and robustness, as well as adaptability towards large number of connections. These properties contribute towards a better user experience for variant kinds of services.

This workshop aims to provide a platform for the leading researchers in this area, both from academia and industry, to share their views and the most recent ideas, progress in algorithm and procedure design, as well as prototype implementation in lab or field on NoMA related techniques for 5G radio access networks. The workshop also aims to stimulate enthusiastic discussions among all experts on how the NoMA can best fit in the whole system design and help to meet the diverse requirements of 5G radio networks for eMBB, mMTC, as well as URLLC services.

General Chairs:

Peiyang Zhu, Huawei Technologies
Yoshihisa Kishiyama, NTT DoCoMo
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Zhiguo Ding, Lancaster University
Rui Yin, Georgia Institute of Technology
Yiqing Cao, Qualcomm Technologies
Zhijin Qin, Imperial College
Chao Wang, Huawei Technologies
Yu Zhang, Zhejiang University of Technology

Program

Sunday, 24 Sept. 2017 9:00-10:30 Toronto II Ballroom

Session 1 Oral Presentations

- 1 Blind Multiple User Detection for Grant-free MUSA without Reference Signal**
Zhifeng Yuan, Chunlin Yan, Yifei Yuan, Weimin Li, ZTE Corporation
- 2 Low complexity detection algorithm for low PAPR interleaving based NoMA schemes**
Chen Qian, Qi Xiong, Bin Yu, Chengjun Sun, Samsung Electronics
- 3 On the Performance of IDMA-based Non-Orthogonal Multiple Access Schemes**
Afshin Haghighat, Shahrokh Nayeb Nazar, Robert Olesen, InterDigital
- 4 Two Simplified Multiuser Detection Algorithms For Uplink SCMA Systems Via Generalized Approximate Message Passing**
Yu Huang, Yunzhou Li, Jing Wang, Tsinghua University
- 5 A survey of Non-Orthogonal Multiple Access for 5G**
Kun Lu, Zhanji Wu, Beijing University of Posts and Telecommunications

- 6 Ultra-Dense Networks in 5G: Interference Management via NoMA and Treating Interference as Noise**
Navid Naderializadeh, Oner Orhan, Intel Corporation; Hosein Nikopour, Intel Labs; Shilpa Talwar, Intel Corporation

Sunday, 24 Sept. 2017 11:00-12:30 Toronto II Ballroom

Session 2 Keynotes Speeches I

- 1 NOMA – A Paradigm Shift in Multiple Access for Next Generation Wireless Networks**
Zhiguo Ding, Lancaster University
- 2 Scalable SCMA**
Jianglei Ma, Huawei Technologies
- 3 Non-orthogonal Multiple Access for Internet of Things**
Zhaoyang Zhang, Zhejiang University

Sunday, 24 Sept. 2017 14:00-15:00 Toronto II Ballroom

Session 3 Keynotes Speeches II

- 1 The Myths, Realities and Futures of NOMA: A Historic Perspective on FDMA, TDMA, CDMA, OFDMA, SDMA, IDMA, CCMA and 'all that'...**
Lajos Hanzo, University of Southampton
- 2 NOMA: Principles and New Results**
Jinho Choi, Gwangju Institute of Science and Technology

Sunday, 24 Sept. 2017 15:00-16:30 Toronto II Ballroom

Session 4 Posters

1 A Nonbinary LDPC-Coded SCMA System with Optimized Codebook Design

Qingli He, B. Bai, Dan Feng, Hengzhou Xu, Min Zhu, Xidian University

2 A Novel Opportunistic NOMA Scheme for 5G Massive MIMO Multicast Communications

Ke Xiao, Shun Dai, North China University of Technology; Humphrey Rutagemwa, Bo Rong, Communications Research Centre Canada, Gong Liang, Academy of Broadcast Planning; Kadoch Michel, Ecole de technologie superieure

3 A Novel Uplink NOMA Scheme Based on Low Density Superposition Modulation

Chengxin Jiang, Zhanji Wu, Beijing University of Posts and Telecommunications

4 Bandwidth Minimization under Probabilistic Constraints and Statistical CSI for NOMA

Krishna Chitti, Fredrik Rusek, Lund University; Tumula V. K. Chaitanya, Huawei Technologies Sweden AB

5 Detection of Carrier-Interferometry Code Based Overloaded Multi-carrier CDMA Signals

Ming-Shiu Li, Yu T. Su, National Chiao Tung University

6 Hybrid Message Passing based Low Complexity Receiver for SCMA System over Frequency Selective Channels

Weijie Yuan, Beijing Institute of Technology; Huiming Huang, BSIR; Nan Wu, Beijing Institute of Technology; Lei Zhou, BSIR; Jingming Kuang, Beijing Institute of Technology

7 Investigation of Non-Orthogonal Multiple Access Techniques for Future Cellular Networks

Ryan Keating, Rapeepat Ratasuk, Nokia Networks; Amitava Ghosh, Nokia

8 Joint Pattern Assignment and Power Allocation in PDMA

Jie Zeng, Tsinghua University; Bei Liu, Chongqing University of Post and Communications; Xin Su, Tsinghua University

9 Non-Orthogonal Multiple Access with Low Code Rate Spreading and Short Sequence Based Spreading

Sergey Sosnin, Intel Corp.; Gang Xiong, Intel Corporation; Debdeep Chatterjee, Intel; Yongjun Kwak, Intel Corporation

10 On Power Allocation and User Grouping for Sparse Coded Non-Orthogonal Multiple Access in the Downlink

Johannes Dommel, Staphan Fähse, Lars Thiele, Fraunhofer HHI

11 On the performance of Non-orthogonal Multiple Access (NOMA) in a Cloud-RAN system

Rupesh Singh Rai, Jiangzhou Wang, H. Zhu, University of Kent

12 Resource Spread Multiple Access - A Novel transmission scheme for 5G Uplink

Yiqing Cao, Haitong Sun, Joseph Soriaga, Tingfang Ji, Qualcomm Technologies Inc.

13 SCMA-Based Uplink and Downlink Resource Reuse for Clustered mMTC

FangSheng Zhong, Ming Zhao, Zhou Wuyang, University of Science and Technology of China

14 Statistical QoS Provisioning for Half/Full-Duplex Cooperative Non-Orthogonal Multiple Access

Xianhao Chen, Gang Liu, Zheng Ma, Southwest Jiaotong University

15 System-level performance of C-NOMA: a cooperative scheme for capacity enhancements in 5G mobile networks

Andrea Marciano, Henrik L. Christiansen, Technical University of Denmark

Sunday, 24 Sept. 2017 16:30-17:30 Toronto II Ballroom

Session 5 Panel

NoMA Enabled 5G New Radio, How Different Will It Be?

Moderator: Yan Chen, Huawei Technologies

Panelists: Yoshihisa Kishiyama, NTT DoCoMo
Jianglei Ma, Huawei Technologies
Zhiguo Ding, Lancaster University
Lajos Hanzo, University of Southampton
Zhaoyang Zhang, Zhejiang University
Jinho Choi, GIST