

### PROGRAM OF THE ROUND TABLE DISCUSSION ON "AI IN TELECOMMUNICATIONS"

Moderators:

**Uma Shanker Tiwary, Indian Institute of Information Technology, India**

**Mikhail S. Burtsev, Head of Neural Systems and Deep Learning Laboratory, MIPT, Russia**

**November 20, 2019, 14:30 – 18:30. MIPT, Campus "FIZTECH. ARCTIC", "LECTURE HALL"**

The purpose of the round table is to figure out the modern state and perspectives of AI concept for application in telecommunication domain development; what is the performance bound of an End-to-End (E2E) communication systems; advantage of reinforcement learning and meta-learning utilization for complicated optimization problems in LowMAC and RRM layer solution; evaluate the opportunity of NLP concept embedding into information theory for telecommunication systems enhancements.

No	Speaker	Topic	Time
1	<b>Uma Shanker Tiwary</b> , Indian Institute of Information Technology, India	Welcome speech	14:30-14:40
2	<b>Uma Shanker Tiwary</b> , Indian Institute of Information Technology, India	Trends in telecommunication: role of AI	14:40-15:00
3	<b>Neetesh Purohit</b> , Indian Institute of Information Technology, India	The communication systems remove redundancies generated by the information source and then add redundancy generated by itself for error control purpose. Can AI help in exploring the merits of the redundancy generated by the source itself for error control purpose?	15:00-15:20
4	<b>Irina Basieva</b> , Huawei Technologies	RRM + ML = RL	15:20-15:40
5	<b>Mikhail S. Burtsev</b> , Head of Neural Systems and Deep Learning Laboratory, MIPT, Russia	ML models selection in preparation for operation	15:40-16:00

#### Coffee break 16:00-16:30

6	Discussion moderators <b>Uma Shanker Tiwary,</b> <b>Mikhail Burtsev</b>	<ul style="list-style-type: none"> <li>• What kind of advantages of Machine Learning from theory might be emphasized for E2E Air Interface (PHY) Design? [<b>Neetesh Purohit</b>]</li> <li>• Can E2E communication system break through Shannon's limit under certain circumstances? If so, what are these application scenarios and can they direct us to an innovative air interface which can provide us significant benefits over 5G system? [<b>Neetesh Purohit</b>]</li> <li>• The network has multiple KPI to measure its quality and behavior in all different aspects, which are quite different for different service types. RL and Meta-learning usually require a rewarding function to drive its self-optimization. How to properly model a rewarding mechanism (maybe not a simple rewarding function) to reflect and balance multiple target KPI's and also design effective RL algorithms is a critical issue? [<b>Uma Shanker Tiwary</b>]</li> <li>• During the exploration steps of RL, the rewardings will go through large variations. However, it is not allowed to have evident KPI changes during network operation. How to add constrains in RL framework to restrict rewarding variation in a bounded manner is very important for commercialization? [<b>Irina Basieva</b>]</li> <li>• Synergy of the information theory in telecom and NLP techniques: what are the ability of NLP approach be an evolution of information transmission theory through the concept of meaningful information delivery instead of redundant raw information transmission? [<b>Mikhail Burtsev</b>]</li> </ul>	
7	<b>Uma Shanker Tiwary,</b> <b>Mikhail Burtsev</b>	Conclusion	18:00 – 18:30
8	All participants	Cheese & Wine	18:30 – 20:00

**Round table languages: Russian and English**