



IEEE BlackSeaCom™

**IEEE International Black Sea Conference
on Communications and Networking**

26-29 May 2020 // Virtual Conference

The Odyssey of Communications and Networking in the Black Sea Region Continues

**IEEE
ComSoc™**
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Closing Remarks for Technical Program



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- 101 submissions received
 - 66 submissions to regular track
 - 32 submissions to Special Session
 - 3 submissions to Demo and Short Paper Tracks
- 46 papers accepted in all tracks
 - 32 in regular track
 - 11 in Special Session
 - 3 as Demo and Short Papers
- Each paper has been reviewed by at least 3 reviewers
- 63 TPC members
 - Average load per TPC Member: 4.7 papers



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- Author demographics:
 - USA(45), Canada(9), Ukraine (39), Russia (27), Turkey (81), Egypt (11), UK (6), Malaysia (6), Luxembourg (2), Germany (5), Italy(2), France(2), Iraq (3), Israel (1), Saudi Arabia (1), Kazakhstan (1)
- Technical Program:
 - 4 tutorials
 - 3 keynotes
 - 15 technical sessions
 - 10 regular track sessions
 - 4 Special Session
 - 1 Demo Session



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Best Paper Award

Search-Free Precoder Selection for 5G New Radio using Neural Networks

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Abstract—We propose a search-free precoder selection method with neural networks motivated by the fact that large codebook sizes are adopted in 5G New Radio (5G-NR). The proposed method does not require an explicit codebook search unlike the traditional selection algorithms. Instead, it aims at finding the precoder matrix index that maximizes the corresponding channel capacity using a neural network directly. The network is trained off-line using extensive simulated data with the underlying channel statistics; however, the actual selection algorithm is based on simple calculations with the neural network, hence it is feasible for real time implementation. We demonstrate that the proposed search-free selection algorithm is highly efficient, i.e., it results in a performance very close to optimal precoder in the codebook while its complexity is significantly lower. Simulations with realistic channel models of 5G-NR corroborate these observations as well. We also show that pruning of the trained neural network gives a way to achieve further complexity reduction with a very small reduction in the system performance.

Index Terms— 5G New Radio, MIMO, channel state information, precoding, neural networks.



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Thank you and see you in Romania at IEEE BlackSeaCom2021!