End-to-End Simulation of 5G mmWave Networks

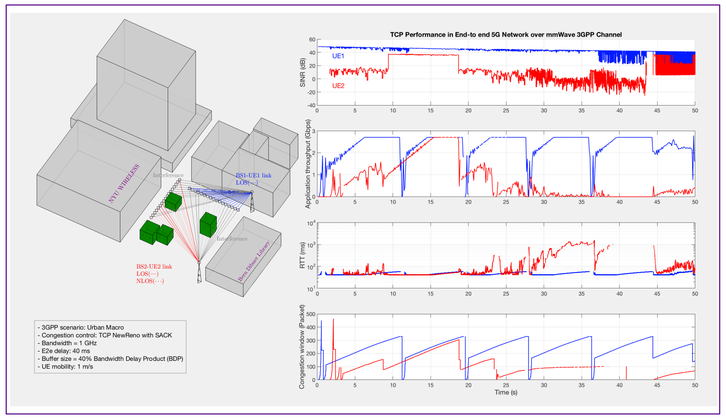
M. Mezzavilla, M. Zhang, M. Polese, R. Ford, S. Dutta, S. Rangan, M. Zorzi

NYU WIRELESS

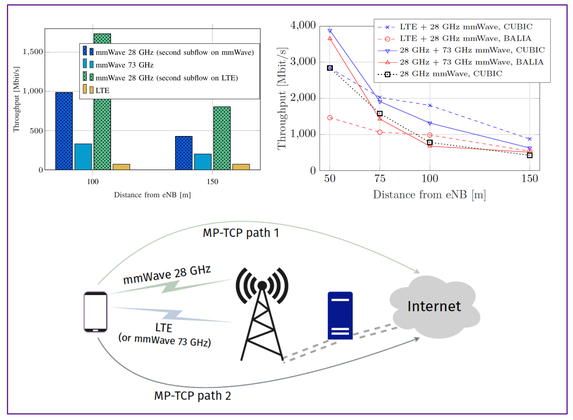
Università degli Studi di Padova

Rapid prototyping and performance evaluation for the next generation of mmWave 5G networks

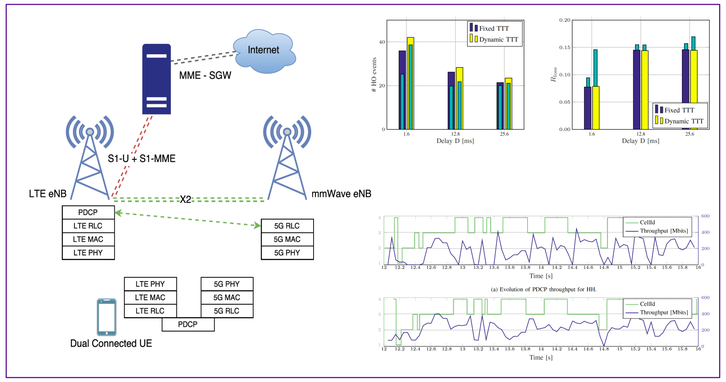
TCP PERFORMANCE



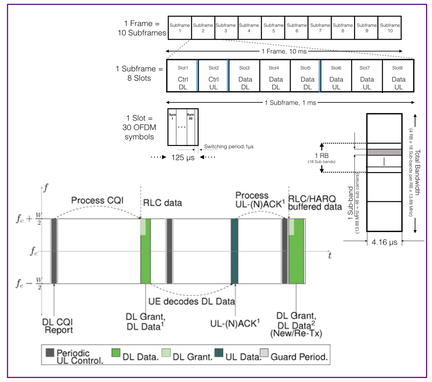
MULTIPATH TCP



MULTI-CONNECTIVITY / HANDOVER

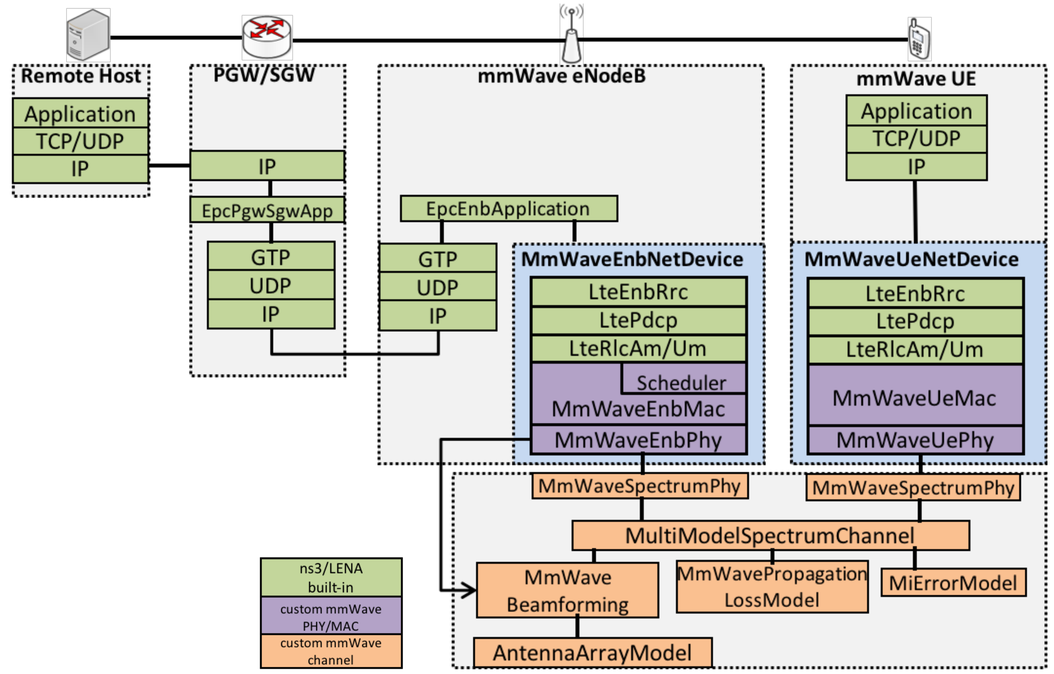


HIGH-SPEED MAC

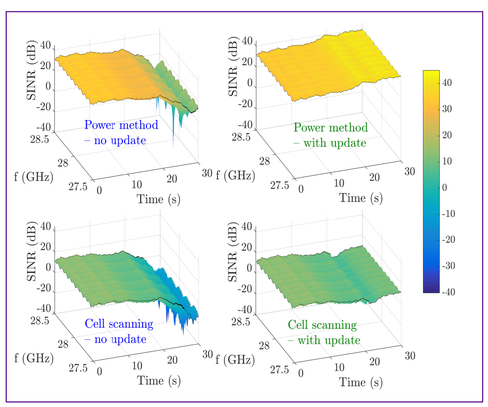


PUBLICATIONS

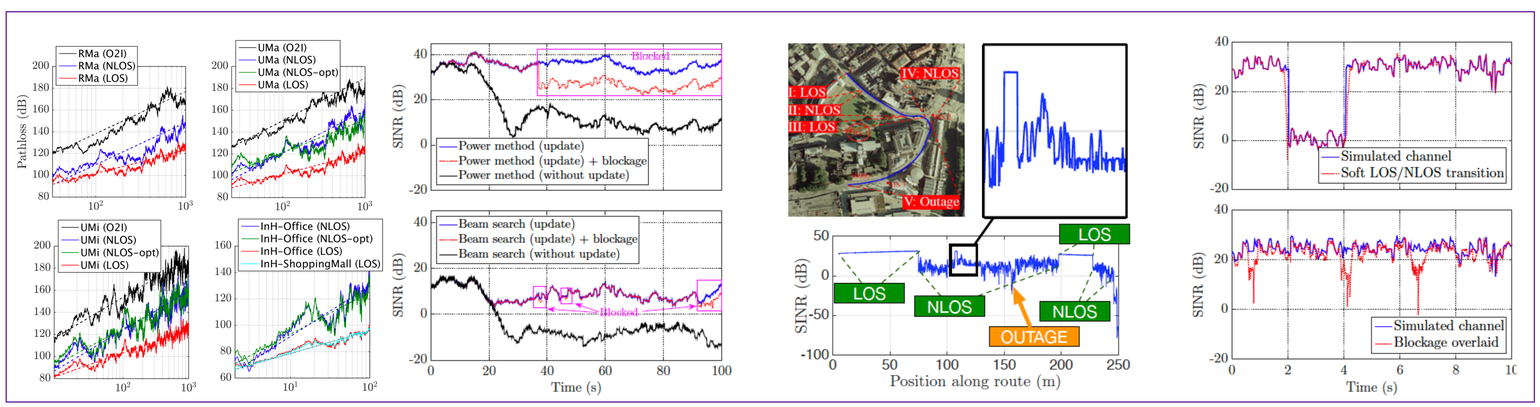
- ns-3 mmWave module: https://github.com/nyuwireless/ns3-mmwave
- Marco Mezzavilla, Sourjya Dutta, Menglei Zhang, Mustafa Riza Akdeniz, Sundeep Rangan, *5G mmWave Module for ns-3 Network Simulator*, MSWiM '15 Proceedings of the 18th ACM International Conference on Modeling, Analysis and Simulation of Wireless and Mobile Systems
- Russell Ford, Menglei Zhang, Sourjya Dutta, Marco Mezzavilla, Sundeep Rangan, Michele Zorzi, *A Framework for End-to-End Evaluation of 5G mmWave Cellular Networks in ns-3*, in Proceedings of the Workshop ns-3 (WNS3) 2016
- Menglei Zhang, Marco Mezzavilla, Russell Ford, Sundeep Rangan, Shivendra Panwar, Evangelos Mellios, Di Kong, Andrew Nix, Michele Zorzi, *Transport Layer Performance in 5G mmWave Cellular*, IEEE INFOCOM mmWave Networking Workshop 2016
- S. Dutta, M. Mezzavilla, R. Ford, M. Zhang, S. Rangan, M. Zorzi, *Frame Structure Design and Analysis for Millimeter Wave Cellular Systems*, IEEE Transactions for Wireless Communications 2016
- S. Dutta, M. Mezzavilla, R. Ford, M. Zhang, S. Rangan, M. Zorzi, *MAC Layer Frame Design for Millimeter Wave Cellular System*, *EuCNC 2016*
- R. Ford, M. Zhang, M. Mezzavilla, S. Dutta, S. Rangan, M. Zorzi, *Achieving Ultra-Low Latency in 5G Millimeter Wave Cellular Networks*, IEEE COMMAG 2016
- M. Giordani, M. Mezzavilla, S. Rangan, M. Zorzi, *Multi-Connectivity in 5G mmWave Cellular Networks*, in Mediterranean Ad Hoc Networking Workshop 2016
- M. Polese, M. Mezzavilla, M. Zorzi, *Performance Comparison of Dual Connectivity and Hard Handover for LTE-5G Tight Integration*, EAI SIMUtools 2016 conference
- M. Polese, *Performance Comparison of Dual Connectivity and Hard Handover for LTE-5G Tight Integration in mmWave Cellular Networks*, Master's Thesis carried out by Michele Polese
- M. Zhang , M. Polese, M. Mezzavilla , S. Rangan , M. Zorzi *ns-3 Implementation of the 3GPP MIMO Channel Model for Frequency Spectrum above 6 GHz*," accepted at WNS3 2017
- M. Zhang, M. Mezzavilla, J. Zhu, S. Rangan, S. Panwar, *The Bufferbloat Problem over Intermittent Multi-Gbps mmWave Links*, submitted at IEEE SPAWC 2017
- M. Polese, R. Jana, M. Zorzi, *TCP in 5G mmWave Networks: Link Level Retransmissions and MP-TCP*, accepted for presentation at the 2017 IEEE Conference on Computer Communications Workshops (INFOCOM WKSHPS)
- M. Polese, R. Jana, M. Zorzi, *TCP and MP-TCP in mmWave Mobile Networks*, submitted to IEEE Internet Computing magazine, special issue on 5G (minor revision requested)
- T. Azzino, M. Drago, M. Polese, A. Zanella, M. Zorzi, *X-TCP: A Cross Layer Approach for TCP Uplink Flows in mmWave Networks,* to be presented at Mediterranean Ad Hoc Networking Workshop 2017
- M. Mezzavilla, M. Zhang, M. Polese, R. Ford, S. Dutta, S. Rangan, M. Zorzi, End-to-End Simulation of 5G mmWave Networks, submitted to IEEE Communication Surveys & Tutorials



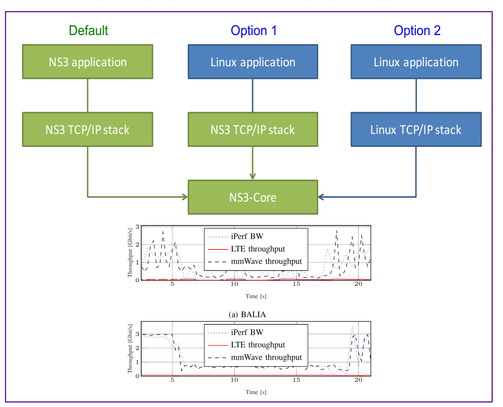
BEAMFORMING



MMWAVE CHANNEL



DIRECT CODE EXECUTION



Contact: michele@polese.io