PERSONAL INFORMATION

Michele Polese

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Nationality Italian

SUMMARY

Ph.D. Candidate in Information Engineering, studying next-generation wireless networks with a system-level perspective. I am interested in the design of algorithms and architectures for mmWave cellular networks, in the application of machine learning techniques to self organizing networks, and in the full-stack, end-to-end performance evaluation of complex networks. I collaborated with several academic and industrial research partners, including Intel, InterDigital, NYU, AT&T Labs, University of Aalborg, King's College, Northeastern University and NIST.

EDUCATION AND TRAINING

10/2016–02/2020 (expected)   ### Ph.D. in Information Engineering

University of Padova, Italy

Supervisor: Prof. Michele Zorzi

Thesis title (tentative): Protocols and architectures for a consistent end to end user experience in 5G mmWave networks

10/2014–07/2016   ### M. Sc. in Telecommunications Engineering

University of Padova, Italy

Final grade: 110/110 summa cum laude

GPA: 30/30

10/2011–07/2014   ### B. Sc. in Information Engineering

University of Padova, Italy

Final grade: 110/110 summa cum laude

GPA: 29.86/30

WORK EXPERIENCE

10/2016–02/2020 (expected)   ### Research Assistant

University of Padova, Italy

03/2019–07/2019   ### Visiting Scholar

Northeastern University, Boston, MA

Supervisor: Prof. Tommaso Melodia

Experimental research on end-to-end mmWave networks

05/2017–04/2019   ### No-cost collaborator

AT&T Labs, Bedminster, NJ

Supervisor: Rittwik Jana

Machine learning in cellular networks, transport layer issues at mmWaves

2017–2019   Contractor

Consorzio Futuro in Ricerca, Ferrara, Italy

Multiple projects with InterDigital on beam management and Integrated Access and Backhaul for 3GPP NR

04/2018–06/2018   Visitor

AT&T Labs, Bedminster, NJ

Supervisor: Rittwik Jana

Machine learning in cellular networks

04/2017   Visiting Academic

NYU Wireless, New York University, Brooklyn, NY

Supervisor: Prof. Sundeep Rangan

End-to-end performance evaluation of mmWave networks

09/2015–02/2018   Teaching Assistant

University of Padova, Italy

Telecommunications Networks for the M.Sc. in Telecommunication and Computer Engineering

Final projects definition and evaluation, mentoring, labs on LTE networks and exercises

09/2013–05/2015   Collaborator

Liverobotics, Oderzo, Italy

Implementation of a video streaming platform for connected drones, project selected for the European Maker Faire in Rome (October 2014)

PROFESSIONAL ACTIVITIES

TPC Member

Workshop on ns-3, 2019

Reviewer

Peer reviews in multiple IEEE, ACM and Elsevier Journals and Conferences:

- IEEE Journal on Selected Areas in Communications
- IEEE Communications Surveys & Tutorials
- IEEE Communications Magazine
- IEEE Communications Letters
- IEEE Access
- IEEE Network
- IEEE Transactions on Communications
- IEEE Transactions on Mobile Computing
- IEEE Transactions on Multimedia
- IEEE Transactions on Vehicular Technology
- IEEE Transactions on Wireless Communications
- IEEE Vehicular Technology Magazine
- Elsevier Computer Communications
- European Wireless
- IEEE ICC
- IEEE ICNC
- IEEE VTC
- IEEE WCNC
- WNS3

PERSONAL SKILLS

Mother tongue   Italian

Other languages

UNDERSTANDING		SPEAKING		WRITING
Listening	Reading	Spoken interaction	Spoken production	
C1	C1	C1	C1	C1

English is shown in the row above.

Levels: A1 and A2: Basic user – B1 and B2: Independent user – C1 and C2: Proficient user
Common European Framework of Reference for Languages

Computer skills
- advanced knowledge of discrete events simulators (ns-3, OMNeT++)
- contributor to the ns-3 open source project
- programming and scripting with different languages (C, C++, java, python, javascript, MAT-LAB, perl, bash)
- Apache Spark and Hadoop
- Git, svn, mercurial
- LaTeX

Communication and managerial skills
- divulgation: I have delivered several invited presentations and an online webinar for IEEE to present the results of my research.
- supervision: I have co-supervised two thesis for the M.Sc. in Telecommunications Engineering at the University of Padova (both full marks). As teaching assistant, I supervised different groups of students whose final project results were published in international peer-reviewed conferences and journals.
- team work: I worked in research teams with people from different cultural backgrounds, both on site and remotely, also with organizational roles in the teams.

PUBLICATIONS

Journals

[1] M. Polese, M. Giordani, M. Mezzavilla, S. Rangan, and M. Zorzi, "Improved Handover Through Dual Connectivity in 5G mmWave Mobile Networks," *IEEE Journal on Selected Areas in Communications*, vol. 35, no. 9, pp. 2069–2084, September 2017.

[2] M. Polese, R. Jana, and M. Zorzi, "TCP and MP-TCP in 5G mmWave Networks," *IEEE Internet Computing*, vol. 21, no. 5, pp. 12–19, September 2017.

[3] M. Mezzavilla, M. Zhang, M. Polese, R. Ford, S. Dutta, S. Rangan, and M. Zorzi, "End-to-end simulation of 5g mmwave networks," *IEEE Communications Surveys and Tutorials*, vol. 20, no. 3, pp. 2237–2263, Third quarter 2018.

[4] M. Mezzavilla, M. Polese, A. Zanella, A. Dhananjay, S. Rangan, C. Kessler, T. S. Rappaport, and M. Zorzi, "Public Safety Communications above 6 GHz: Challenges and Opportunities," *IEEE Access*, vol. 6, pp. 316–329, 2018.

[5] M. Dalla Cia, F. Mason, D. Peron, F. Chiariotti, M. Polese, T. Mahmoodi, M. Zorzi, and A. Zanella, "Using Smart City Data in 5G Self-Organizing Networks," *IEEE Internet of Things Journal*, vol. 5, no. 2, pp. 645–654, April 2018.

[6] M. Zhang, M. Polese, M. Mezzavilla, J. Zhu, S. Rangan, S. Panwar, and a. M. Zorzi, "Will TCP Work in mmWave 5G Cellular Networks?" *IEEE Communications Magazine*, vol. 57, no. 1, pp. 65–71, January 2019.

[7] M. Giordani, M. Polese, A. Roy, D. Castor, and M. Zorzi, "Standalone and Non-Standalone Beam Management for 3GPP NR at mmWaves," *IEEE Communications Magazine*, vol. 57, no. 4, pp. 123–129, April 2019.

[8] ——, "A Tutorial on Beam Management for 3GPP NR at mmWave Frequencies," *IEEE Communications Surveys and Tutorials*, vol. 21, no. 1, pp. 173–196, First quarter 2019.

[9] M. Polese, R. Jana, V. Kounev, K. Zhang, S. Deb, and M. Zorzi, "Machine Learning at the Edge: A Data-Driven Architecture with Applications to 5G Cellular Networks," *submitted to IEEE Transactions on Mobile Computing*, 2018.

[10] M. Polese, F. Chiariotti, E. Bonetto, F. Rigotto, A. Zanella, and M. Zorzi, "A Survey on Recent Advances in Transport Layer Protocols," *submitted to IEEE Communication Surveys and Tutorials*, 2019.

Conferences

[11] M. Polese, M. Centenaro, A. Zanella, and M. Zorzi, "M2M massive access in LTE: RACH performance evaluation in a Smart City scenario," in *2016 IEEE International Conference on Communications (ICC)*, May 2016, pp. 1–6.

[12] M. Polese, M. Mezzavilla, and M. Zorzi, "Performance Comparison of Dual Connectivity and Hard Handover for LTE-5G Tight Integration," in *Proceedings of the 9th EAI International Conference on Simulation Tools and Techniques*, ser. SIMUTOOLS'16, Prague, Czech Republic, 2016, pp. 118–123.

[13] F. Chiariotti, D. Del Testa, M. Polese, A. Zanella, G. M. Di Nunzio, and M. Zorzi, "Learning methods for long-term channel gain prediction in wireless networks," in *International Conference on Computing, Networking and Communications (ICNC2017)*, January 2017.

[14] M. Polese, R. Jana, and M. Zorzi, "TCP in 5G mmWave Networks: Link Level Retransmissions and MP-TCP," in *2017 IEEE Conference on Computer Communications Workshops (INFOCOM WKSHPS)*, May 2017.

[15] E. Lovisotto, E. Vianello, D. Cazzaro, M. Polese, F. Chiariotti, D. Zucchetto, A. Zanella, and M. Zorzi, "Cell Traffic Prediction Using Joint Spatio-Temporal Information," in *6th International Conference on Circuits and Systems Technologies (MOCAST)*, May 2017.

[16] M. Zhang, M. Polese, M. Mezzavilla, S. Rangan, and M. Zorzi, "ns-3 Implementation of the 3GPP MIMO Channel Model for Frequency Spectrum above 6 GHz," in *Proceedings of the 9th Workshop on ns-3*, Porto, Portugal, 2017, pp. 71–78.

[17] T. Azzino, M. Drago, M. Polese, A. Zanella, and M. Zorzi, "X-TCP: A Cross Layer Approach for TCP Uplink Flows in mmWave Networks," in *16th Annual Mediterranean Ad Hoc Networking Workshop (Med-Hoc-Net'17)*, June 2017.

[18] M. Dalla Cia, F. Mason, D. Peron, F. Chiariotti, M. Polese, T. Mahmoodi, M. Zorzi, and A. Zanella, "Mobility-aware Handover Strategies in Smart Cities," in *International Symposium on Wireless Communication Systems (ISWCS)*, August 2017.

[19] M. Polese, M. Mezzavilla, S. Rangan, and M. Zorzi, "Mobility Management for TCP in mmWave Networks," in *Proceedings of the 1st ACM Workshop on Millimeter-Wave Networks and Sensing Systems 2017*, ser. mmNets '17. Snowbird, Utah, USA: ACM, 2017, pp. 11–16.

[20] M. Gentil, A. Galeazzi, F. Chiariotti, M. Polese, A. Zanella, and M. Zorzi, "A deep neural network approach for customized prediction of mobile devices discharging time," in *2017 IEEE Global Communications Conference (GLOBECOM)*, Dec 2017, pp. 1–6.

[21] M. Polese, M. Mezzavilla, M. Zhang, J. Zhu, S. Rangan, S. Panwar, and M. Zorzi, "milliProxy: A TCP proxy architecture for 5G mmWave cellular systems," in *2017 51st Asilomar Conference on Signals, Systems, and Computers*, Oct 2017, pp. 951–957.

[22] M. Polese, M. Mezzavilla, S. Rangan, C. Kessler, and M. Zorzi, "mmwave for future public safety communications," in *Proceedings of the First CoNEXT Workshop on ICT Tools for Emergency Networks and DisastEr Relief*, ser. I-TENDER '17. Incheon, Republic of Korea: ACM, 2017, pp. 44–49. [Online]. Available: http://doi.acm.org/10.1145/3152896.3152905

[23] M. Drago, T. Azzino, M. Polese, C. Stefanovic, and M. Zorzi, "Reliable Video Streaming over mmWave with Multi Connectivity and Network Coding," in *International Conference on Computing, Networking and Communications (ICNC)*, March 2018, pp. 508–512.

[24] T. Zugno, M. Polese, and M. Zorzi, "Integration of Carrier Aggregation and Dual Connectivity for the ns-3 mmWave Module," in *Proceedings of the 10th Workshop on Ns-3*, ser. WNS3 '18, Surathkal, India, 2018, pp. 45–52.

[25] M. Polese and M. Zorzi, "Impact of Channel Models on the End-to-End Performance of mmWave Cellular Networks," in *Proceedings of the 19th International Workshop on Signal Processing Advances in Wireless Communications (SPAWC)*, June 2018.

[26] M. Giordani, M. Polese, A. Roy, D. Castor, and M. Zorzi, "Initial access frameworks for 3GPP NR at mmWave frequencies," in *2018 17th Annual Mediterranean Ad Hoc Networking Workshop (Med-Hoc-Net)*, June 2018, pp. 1–8.

[27] M. Polese, M. Giordani, A. Roy, S. Goyal, D. Castor, and M. Zorzi, "End-to-End Simulation of Integrated Access and Backhaul at mmWaves," in *IEEE 23rd International Workshop on Computer Aided Modeling and Design of Communication Links and Networks (CAMAD)*, September 2018.

[28] M. Polese, M. Giordani, A. Roy, D. Castor, and M. Zorzi, "Distributed Path Selection Strategies for Integrated Access and Backhaul at mmWaves," in *IEEE Global Communications Conference (GLOBECOM)*, Dec 2018.

[29] M. Rebato, M. Polese, and M. Zorzi, "Multi-Sector and Multi-Panel Performance in 5G mmWave Cellular Networks," in *IEEE Global Communications Conference (GLOBECOM)*, Dec 2018.

[30] M. Polese, R. Jana, V. Kounev, K. Zhang, S. Deb, and M. Zorzi, "Exploiting spatial correlation for improved user prediction in 5G cellular networks," in *Proceedings of the Information Theory and Applications Workshop*, ser. ITA '19, San Diego, 2019.

[31] M. Polese, T. Zugno, and M. Zorzi, "Implementation of Reference Public Safety Scenarios in ns-3," in *Proceedings of the 11th Workshop on Ns-3*, ser. WNS3 '19, Florence, Italy, 2019.

[32] A. De Biasio, F. Chiariotti, M. Polese, A. Zanella, and M. Zorzi, "A QUIC Implementation for ns-3," in *Proceedings of the 11th Workshop on Ns-3*, ser. WNS3 '19, Florence, Italy, 2019.

Book Chapters

[33] M. Polese, M. Giordani, and M. Zorzi, "3GPP NR: the standard for 5G cellular networks," in *5G Italy White eBook: from Research to Market*, 2018.

AWARDS

Best Journal Paper Award of the IEEE ComSoc Technical Committee on Communications Systems Integration and Modeling (CSIM) 2019 for the paper [3]

Best Paper Award at the Workshop on ns-3 (WNS3) 2019 for the paper [32]

Honourable Mention at the HIT-DIGITALmeet Young Researchers Award, Padova, October 2018