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	
English	C1	C1	C1	C1	C1

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, MATLAB, 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, 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.

[31] 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

[32] 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]

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