Michele Polese

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RESEARCH INTERESTS

Next-generation AI-driven wireless networks, 5G/6G, AI-RAN, and Open RAN. Open, intelligent, and programmable end-to-end network architectures. Open-source networking software and experimental wireless testbeds. My research on dApps is now part of the NVIDIA 5G Aerial stack. I am the chair of the AI-RAN Alliance AI-and-RAN working group.

Google Scholar profile: `https://tinyurl.com/polese` **Citations:** 12433 **h-index:** 46 (12/01/2025)

EDUCATION

Ph.D. in Information Engineering February 2020
University of Padova, Padova, Italy End-to-end design and evaluation of mmWave cellular networks
Supervisor: Prof. Michele Zorzi

M.Sc. in Telecommunications Engineering July 2016
University of Padova, Padova, Italy

B.Sc. in Information Engineering July 2014
University of Padova, Padova, Italy

RESEARCH EXPERIENCE

Northeastern University | Boston, MA | *Institute for the Wireless Internet of Things, ECE*

- Research Assistant Professor October 2023 - Present
- Principal Research Scientist January 2021 - September 2023
- Associate Research Scientist March 2020 - January 2021
- Visiting Ph.D. Student March 2019 - July 2019

AT&T Labs | Bedminster, NJ

- Visiting Ph.D. Student April 2018 - June 2018

New York University | Brooklyn, NY | *NYU Wireless*

- Visiting Ph.D. Student April 2017

Consorzio Futuro in Ricerca | Ferrara, Italy

- Consultant Multiple contracts, 2017-2019

RESEARCH GRANTS

Grants | *PI and Co-PI in grants for $18.6M+, senior personnel in grants for $2M+*

- SpectraNet: Prototyping and Demonstrating Ubiquitous, Collaborative, Secure, and Fast Spectrum Sharing with RAN-as-a-Sensor Millisecond-level Spectrum Sensing
  National Spectrum Consortium/OUSD R&E, $2.5M (prime total $7.9M) Northeastern PI, 2026-2027
- POSE: Phase II: CROSSComm: Coordinating a Reference Open-Source System Community for Intelligent Future-G Networks
  NSF CNS-2449452, $1.5M PI, 2025-2027
- From Open RAN to Open Spectrum - Sharing Spectrum, Services, and Infrastructure in Spectrum Era 4
  NSF CNS-2449452, $750k PI, 2025-2028
- Zero-trust and Secure-by-Design xApps for Resilient O-RAN Control
  OUSD R&E, zTouch Networks sub, $34k PI, 2025

- AutoRAN: Automated End-to-End Continuous Testing for Open and Disaggregated Cellular Systems
  NTIA Public Wireless Supply Chain Innovation Fund (NOFO 2023), $2M PI, 2024-2026
  - Press: https://tinyurl.com/hd-pr-ntia
- O-DT: O-RAN Digital Twin to Automate O-RAN End-to-End AI/ML Development and Testing on Colosseum
  O-RAN ALLIANCE nGRG Seed Funding, $200k PI, 2024-2025
- SII-NRDZ: MITRE NRDZ-as-a-Service Field Deployment
  NSF AST-2431961, MITRE sub, $1M Co-PI, 2024-2028
- ACCoRD: Acceleration of Compatibility and Commercialization for Open RAN Deployments Consortium
  NTIA Public Wireless Supply Chain Innovation Fund (NOFO 2023 T&E), AT&T and Verizon sub, $1M Co-PI, 2024-2028
- Collaborative Research: SWIFT-SAT: DASS: Dynamically Adjustable Spectrum Sharing between Ground Communication Networks and Earth Exploration Satellite Systems Above 100 GHz
  NSF CNS-2332721, $425k Co-PI, 2024-2027
- DigiRAN: High-Fidelity Digital Twins for Interoperability, Security and Performance Testing of Open RAN Systems
  NTIA Public Wireless Supply Chain Innovation Fund (NOFO 2023), $2M Co-PI, 2024-2026
- TENORAN - Automated and fine-grained energy-efficiency profiling of Open RAN systems via high-fidelity standardized testing scenarios
  NTIA Public Wireless Supply Chain Innovation Fund (NOFO 2023), $2M Co-PI, 2023-2025
  - Press: https://tinyurl.com/ntia-pr-tenoran, https://tinyurl.com/ntia-ngn-tenoran, https://tinyurl.com/ntia-boston-globe
- Open6G: An Open RAN Hub to Jumpstart Next-Generation AI-Driven Connectivity in Massachusetts
  MassTech Collaborative, $1.52M Co-PI, 2023-2024
- NSF-AoF: CISE Core: Small: Enabling Mobile Terahertz Communication for 6G Cellular Networks
  NSF CNS-2225590, $456k Co-PI, 2022-2025
- Open 6G: O-RAN compliant open source protocol stacks for softwarized dynamic networking at the edge
  Office for the Undersecretary of Defense (OUSD) R&E, FutureG Office, $3.3M to date Co-PI, 2022-2028
  - Press: https://tinyurl.com/5n8r8tzx, https://tinyurl.com/3d7ub885
- MRI: Development of X-Mili: An Open, Programmable Platform to Conquer the 5G and 6G Wireless Spectrum,
  NSF CNS-2117814, $2M Senior personnel, 2022-2024
  - Press: https://tinyurl.com/mt5jdc8a

AWARDS

- Best Paper Award at the 20th International Conference on Network and Service Management (CNSM), 2024 [65], 17.4% acceptance rate
- Best Short Paper Award at the IEEE Vehicular Networking Conference (VNC) 2024 [74]
- Best Paper Runner-Up at the 2nd INFOCOM Workshop on Next-Generation Open and Programmable Radio Access Networks (NG-OPERA), 2024 [76]
- 2022 ISSNAF Young Investigator Award for Computer Science
- Finalist for the GTTI Award 2020 for the best Ph.D. thesis in the telecommunications area in Italy
- Best Paper Award at the Workshop on ns-3 (WNS3) 2019 [115] and 2020 [103] and IEEE MedComNet 2020 [105]
- Best Journal Paper Award of the IEEE ComSoc Technical Committee on Communications Systems Integration and Modeling (CSIM) 2019 [51]
- IEEE ComSoc EMEA Outstanding Young Researcher Award, 2019

PUBLICATIONS

A full and update list of publications is available below and at tinyurl.com/polese (55 journals, 5 submitted, 84

conference papers, 4 book chapters since 2016). Three of my publications have garnered over 1000 citations each, and an additional 18 over 100 citations each. The publications are reported in reverse chronological order, with citations as of 12/01/2025.

Journals

[1] M. Polese, N. Mohamadi, S. D'Oro, and T. Melodia, "Beyond Connectivity: An Open Architecture for AI-RAN Convergence in 6G," *arXiv preprint arXiv:2507.06911*, 2025. [Online]. Available: https://arxiv.org/abs/2507.06911

[2] R. Soundrarajan, C. Fiandrino, M. Polese, S. D'Oro, L. Bonati, and T. Melodia, "On AI Verification in Open RAN," *IEEE Communications Magazine (to appear), arXiv preprint arXiv:2510.18417*, 2025.

[3] M. Elkael, S. D'Oro, L. Bonati, M. Polese, Y. Lee, K. Furueda, and T. Melodia, "Agentran: An agentic ai architecture for autonomous control of open 6g networks," *arXiv preprint arXiv:2508.17778*, 2025.

[4] R. Prasad, M. Elkael, G. Gemmi, O. M. Bushnaq, D. Mishra, P. Raut, J. Simonjan, M. Polese, and T. Melodia, "Joint routing, resource allocation, and energy optimization for integrated access and backhaul with open ran," *arXiv preprint arXiv:2509.05467*, 2025.

[5] D. Villa, I. Khan, F. Kaltenberger, N. Hedberg, R. S. da Silva, S. Maxenti, L. Bonati, A. Kelkar, C. Dick, E. Baena, J. M. Jornet, T. Melodia, M. Polese, and D. Koutsonikolas, "X5G: An Open, Programmable, Multi-vendor, End-to-end, Private 5G O-RAN Testbed with NVIDIA ARC and OpenAirInterface," *IEEE Transactions on Mobile Computing*, pp. 1–18, in press 2025, 14 citations.

[6] F. Kaltenberger, T. Melodia, I. Ghauri, M. Polese, R. Knopp, T. T. Nguyen, S. Velumani, D. Villa, L. Bonati, R. Schmidt, S. Arora, M. Irazabal, and N. Nikaein, "Driving Innovation in 6G Wireless Technologies: The OpenAirInterface Approach," *Computer Networks*, pp. 1–37, in press 2025, 17 citations.

[7] M. Elkael, M. Polese, R. Prasad, S. Maxenti, and T. Melodia, "ALLSTaR: Automated LLM-Driven Scheduler Generation and Testing for Intent-Based RAN," 2025, 2 citations. [Online]. Available: https://arxiv.org/abs/2505.18389

[8] S. Maxenti, R. Shirkhani, M. Elkael, L. Bonati, S. D'Oro, T. Melodia, and M. Polese, "AutoRAN: Automated and Zero-Touch Open RAN Systems," 2025, 5 citations. [Online]. Available: https://arxiv.org/abs/2504.11233

[9] E. J. Oughton, G. Geraci, M. Polese, M. Ghosh, W. Webb, and D. Bubley, "The future of wireless broadband in the peak smartphone era: 6g, wi-fi 7, and wi-fi 8," *IEEE Wireless Communications*, pp. 1–8, 2025, 8 citations.

[10] E. Baena, P. Testolina, M. Polese, D. Koutsonikolas, J. Jornet, and T. Melodia, "Space-o-ran: Enabling intelligent, open, and interoperable non terrestrial networks in 6g," *IEEE Communications Magazine (to appear), arXiv CS.NI 2502.15936*, 2025, 9 citations. [Online]. Available: https://arxiv.org/abs/2502.15936

[11] A. Lacava, L. Bonati, N. Mohamadi, R. Gangula, F. Kaltenberger, P. Johari, S. D'Oro, F. Cuomo, M. Polese, and T. Melodia, "dApps: Enabling real-time AI-based Open RAN control," *Computer Networks*, p. 111342, 2025, 22 citations.

[12] J. Groen, S. Di Valerio, I. Karim, D. Villa, Y. Zhang, L. Bonati, M. Polese, S. D'Oro, T. Melodia, E. Bertino, F. Cuomo, and K. Chowdhury, "TIMESAFE: Timing Interruption Monitoring and Security Assessment for Fronthaul Environments," *arXiv:2412.13049 [cs.NI]*, pp. 1–13, December 2024, 4 citations.

[13] J. Groen, S. D'Oro, U. Demir, L. Bonati, D. Villa, M. Polese, T. Melodia, and K. Chowdhury, "Securing O-RAN Open Interfaces," *IEEE Transactions on Mobile Computing*, 2024, 32 citations.

[14] P. Testolina, M. Polese, and T. Melodia, “Sharing Spectrum and Services in the 7–24 GHz Upper Midband,” *IEEE Communications Magazine*, vol. 62, no. 8, pp. 170–177, August 2024, 25 citations.

[15] M. Polese, L. Bonati, S. D’Oro, P. Johari, D. Villa, S. Velumani, R. Gangula, M. Tsampazi, C. Paul Robinson, G. Gemmi, A. Lacava, S. Maxenti, H. Cheng, and T. Melodia, “Colosseum: The Open RAN Digital Twin,” *IEEE Open Journal of the Communications Society*, vol. 5, pp. 5452–5466, 2024, **62 citations**.

[16] L. Bonati, M. Polese, S. D’Oro, P. B. d. Prever, and T. Melodia, “5G-CT: Automated Deployment and Over-the-Air Testing of End-to-End Open Radio Access Networks,” *IEEE Communications Magazine*, pp. 1–6, 2024, 18 citations.

[17] E. Oughton, G. Geraci, M. Polese, V. Shah, D. Bubley, and S. Blue, “Reviewing wireless broadband technologies in the peak smartphone era: 6G versus Wi-Fi 7 and 8,” *Telecommunications Policy*, vol. 48, no. 6, p. 102766, 2024, 25 citations.

[18] M. Tsampazi, S. D’Oro, M. Polese, L. Bonati, G. Poitau, M. Healy, and T. Melodia, “PandORA: Automated Design and Comprehensive Evaluation of Deep Reinforcement Learning Agents for Open RAN,” *IEEE Transactions on Mobile Computing*, pp. 1–18, in press 2024, 17 citations.

[19] P. Brach del Prever, S. D’Oro, L. Bonati, M. Polese, M. Tsampazi, H. Lehmann, and T. Melodia, “Pacifista: Conflict evaluation and management in open ran,” *IEEE Transactions on Mobile Computing*, 2025 (in press), 19 citations.

[20] P. Imputato, T. Henderson, G. Nardini, and M. Polese, “Guest Editorial: Advances in wireless networks simulation,” *Computer Networks*, p. 110812, 2024.

[21] J. Groen, S. D’Oro, U. Demir, L. Bonati, M. Polese, T. Melodia, and K. Chowdhury, “Implementing and Evaluating Security in O-RAN: Interfaces, Intelligence, and Platforms,” *IEEE Network*, pp. 1–1, 2024, **49 citations**.

[22] S. D’Oro, L. Bonati, M. Polese, and T. Melodia, “OrchestRAN: Orchestrating network intelligence in the open RAN,” *IEEE Transactions on Mobile Computing*, 2023, 29 citations.

[23] M. Polese, L. Bonati, S. D’Oro, S. Basagni, and T. Melodia, “Understanding O-RAN: Architecture, Interfaces, Algorithms, Security, and Research Challenges,” *IEEE Communications Surveys & Tutorials*, vol. 25, no. 2, pp. 1376–1411, Second quarter 2023, **1066 citations**.

[24] M. Polese, M. Dohler, F. Dressler, M. Erol-Kantarci, R. Jana, R. Knopp, and T. Melodia, “Empowering the 6G Cellular Architecture with Open RAN,” *IEEE Journal on Selected Areas in Communications*, 2023, **97 citations**.

[25] ——, “Guest Editorial Open RAN: A New Paradigm for Open, Virtualized, Programmable, and Intelligent Cellular Networks,” *IEEE Journal on Selected Areas in Communications*, vol. 42, no. 2, pp. 241–244, 2024, 4 citations.

[26] M. Polese, L. Bonati, S. D’Oro, S. Basagni, and T. Melodia, “ColO-RAN: Developing Machine Learning-Based xApps for Open RAN Closed-Loop Control on Programmable Experimental Platforms,” *IEEE Transactions on Mobile Computing*, vol. 22, no. 10, pp. 5787–5800, Oct 2023, **218 citations**.

[27] M. Polese, X. Cantos-Roman, A. Singh, M. J. Marcus, T. J. Maccarone, T. Melodia, and J. M. Jornet, “Coexistence and Spectrum Sharing Above 100 GHz,” *Proceedings of the IEEE*, vol. 111, no. 8, pp. 928–954, Aug 2023, **56 citations**.

[28] L. Bonati, M. Polese, S. D’Oro, S. Basagni, and T. Melodia, “NeutRAN: An Open RAN Neutral Host Architecture for Zero-Touch RAN and Spectrum Sharing,” *IEEE Transactions on Mobile Computing*, pp. 1–14, 2023, 35 citations.

[29] L. Bonati, M. Polese, S. D'Oro, S. Basagni, and T. Melodia, "OpenRAN Gym: AI/ML development, data collection, and testing for O-RAN on PAWR platforms," *Computer Networks*, vol. 220, p. 109502, 2023, **76 citations**.

[30] A. Lacava, M. Polese, R. Sivaraj, R. Soundrarajan, B. S. Bhati, T. Singh, T. Zugno, F. Cuomo, and T. Melodia, "Programmable and Customized Intelligence for Traffic Steering in 5G Networks Using Open RAN Architectures," *IEEE Transactions on Mobile Computing*, pp. 1–16, 2023, **147 citations**.

[31] P. Testolina, M. Polese, J. M. Jornet, T. Melodia, and M. Zorzi, "Modeling Interference for the Coexistence of 6G Networks and Passive Sensing Systems," *IEEE Transactions on Wireless Communications*, vol. 23, no. 8, pp. 9220–9234, Aug 2024, 12 citations.

[32] D. Villa, M. Tehrani-Moayyed, C. P. Robinson, L. Bonati, P. Johari, M. Polese, and T. Melodia, "Colosseum as a Digital Twin: Bridging Real-World Experimentation and Wireless Network Emulation," *IEEE Transactions on Mobile Computing*, vol. 23, no. 10, pp. 9150–9166, 2024, **68 citations**.

[33] S. D'Oro, M. Polese, L. Bonati, H. Cheng, and T. Melodia, "dApps: Distributed Applications for Real-Time Inference and Control in O-RAN," *IEEE Communications Magazine*, vol. 60, no. 11, pp. 52–58, Nov 2022, **122 citations**.

[34] M. Polese, V. Ariyarathna, P. Sen, J. V. Siles, F. Restuccia, T. Melodia, and J. M. Jornet, "Dynamic spectrum sharing between active and passive users above 100 GHz," *Communications Engineering, **Nature***, vol. 1, no. 1, pp. 1–9, May 2022, 30 citations.

[35] M. Pagin, T. Zugno, M. Polese, and M. Zorzi, "Resource Management for 5G NR Integrated Access and Backhaul: A Semi-Centralized Approach," *IEEE Transactions on Wireless Communications*, vol. 21, no. 2, pp. 753–767, Feb 2022, **72 citations**.

[36] F. Gómez-Cuba, T. Zugno, J. Kim, M. Polese, S. Bahk, and M. Zorzi, "Hybrid Beamforming in 5G mmWave Networks: A Full-Stack Perspective," *IEEE Transactions on Wireless Communications*, vol. 21, no. 2, pp. 1288–1303, Feb 2022, 28 citations.

[37] 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," *IEEE Transactions on Mobile Computing*, vol. 20, no. 12, pp. 3367–3382, Dec 2021, **141 citation**.

[38] M. Lecci, P. Testolina, M. Polese, M. Giordani, and M. Zorzi, "Accuracy Versus Complexity for mmWave Ray-Tracing: A Full Stack Perspective," *IEEE Transactions on Wireless Communications*, vol. 20, no. 12, pp. 7826–7841, Dec 2021, **66 citations**.

[39] L. Bonati, S. D'Oro, M. Polese, S. Basagni, and T. Melodia, "Intelligence and Learning in O-RAN for Data-Driven NextG Cellular Networks," *IEEE Communications Magazine*, vol. 59, no. 10, pp. 21–27, Oct 2021, **388 citations**.

[40] M. Polese, P. Teymoori, and J. Zhu, "Guest editorial: Transport layer innovations for future networks," *IEEE Communications Magazine*, vol. 59, no. 4, pp. 14–15, Apr 2021, 1 citation.

[41] M. Polese, J. M. Jornet, T. Melodia, and M. Zorzi, "Toward End-to-End, Full-Stack 6G Terahertz Networks," *IEEE Communications Magazine*, vol. 58, no. 11, pp. 48–54, Nov 2020, **231 citation**.

[42] T. Zugno, M. Drago, M. Giordani, M. Polese, and M. Zorzi, "Toward standardization of millimeter-wave vehicle-to-vehicle networks: Open challenges and performance evaluation," *IEEE Communications Magazine*, vol. 58, no. 9, pp. 79–85, Sep 2020, **105 citations**.

[43] L. Bonati, M. Polese, S. D'Oro, S. Basagni, and T. Melodia, "Open, programmable, and virtualized 5G networks: State-of-the-art and the road ahead," *Computer Networks (COMNET)*, vol. 182, Aug 2020, **332 citations**.

[44] M. Polese, M. Giordani, T. Zugno, A. Roy, S. Goyal, D. Castor, and M. Zorzi, "Integrated Access and Backhaul in 5G mmWave Networks: Potential and Challenges," *IEEE Communications Magazine*, vol. 58, no. 3, pp. 62–68, Mar 2020, **306 citations**.

[45] M. Giordani, M. Polese, M. Mezzavilla, S. Rangan, and M. Zorzi, "Toward 6G Networks: Use Cases and Technologies," *IEEE Communications Magazine*, vol. 58, no. 3, pp. 55–61, Mar 2020, **2417 citations**.

[46] M. Polese, F. Chiariotti, E. Bonetto, F. Rigotto, A. Zanella, and M. Zorzi, "A Survey on Recent Advances in Transport Layer Protocols," *IEEE Communications Surveys and Tutorials*, vol. 21, no. 4, pp. 3584–3608, Fourth quarter 2019, **203 citations**.

[47] F. Meneghello, M. Calore, D. Zucchetto, M. Polese, and A. Zanella, "IoT: Internet of Threats? A Survey of Practical Security Vulnerabilities in Real IoT Devices," *IEEE Internet of Things Journal*, vol. 6, no. 5, pp. 8182–8201, Oct 2019, **1012 citations**.

[48] 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, Apr 2019, **111 citation**.

[49] ——, "A Tutorial on Beam Management for 3GPP NR at mmWave Frequencies," *IEEE Communications Surveys & Tutorials*, vol. 21, no. 1, pp. 173–196, First quarter 2019, **891 citation**.

[50] 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, Jan 2019, **164 citations**.

[51] 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 & Tutorials*, vol. 20, no. 3, pp. 2237–2263, Third quarter 2018, **558 citations**.

[52] 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, Apr 2018, **73 citations**.

[53] 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, **75 citations**.

[54] 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, Sep 2017, **423 citations**.

[55] 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, Sep 2017, **112 citations**.

Conferences

[56] N. Neasamoni Santhi, D. Villa, M. Polese, and T. Melodia, "Interfo-ran: Real-time in-band cellular uplink interference detection with gpu-accelerated dapps," in *Proceedings of the Twenty-Sixth International Symposium on Theory, Algorithmic Foundations, and Protocol Design for Mobile Networks and Mobile Computing*, ser. MobiHoc '25, 2025, p. 71–80, 1 citation.

[57] P. B. del Prever, P. Testolina, A. Masihi, S. Petrushkevich, M. Polese, T. Melodia, and J. M. Jornet, "Pointing-Error-Induced Fading in an Open-Loop THz Uplink with Hardware Impairments," *IEEE MILCOM Workshops (to appear), arXiv preprint arXiv:2510.17647*, 2025.

[58] N. Longhi, S. D'Oro, L. Bonati, M. Polese, R. Verdone, and T. Melodia, "TailO-RAN: O-RAN Control on Scheduler Parameters to Tailor RAN Performance," *IEEE GLOBECOM (to appear) arXiv preprint arXiv:2508.12112*, 2025, 1 citation.

[59] T. Ropitault, M. Bordin, P. Testolina, M. Polese, P. Johari, N. Golmie, and T. Melodia, "Enabling Site-Specific Cellular Network Simulation Through Ray-Tracing-Driven ns-3," *IEEE CCNC (to appear), arXiv preprint arXiv:2508.04004*, 2026.

[60] P. Testolina, E. Beshaj, M. Polese, and T. Melodia, "Spectrum sharing across terrestrial and non-terrestrial services in the fr3 upper midband," in *2025 IEEE International Symposium on Dynamic Spectrum Access Networks (DySPAN)*, 2025, pp. 1–9.

[61] O. T. Basaran, D. Villa, P. Johari, M. Polese, C. Fiandrino, F. Dressler, and T. Melodia, "Gen-TWIN: Generative-AI-Enabled Digital Twin for Open Radio Access Networks," in *Proceedings of IEEE Digital Twins over NextG Wireless Networks (DTWin)*, London, UK, May 2025, 1 citation.

[62] M. Tsampazi, M. Polese, F. Dressler, and T. Melodia, "O-ris-ing: Evaluating ris-assisted nextg open ran," in *IEEE INFOCOM 2024-IEEE Conference on Computer Communications Workshops (INFOCOM WKSHPS)*, London, UK, May 2025, 2 citations.

[63] M. Bordin, A. Lacava, M. Polese, F. Cuomo, and T. Melodia, "Demo: Enabling deep reinforcement learning research for energy saving in open ran," in *2025 IEEE 22nd Consumer Communications Networking Conference (CCNC)*, 2025, pp. 1–2.

[64] M. Bordin, A. Lacava, M. Polese, S. Satish, M. A. Nittoor, R. Sivaraj, F. Cuomo, and T. Melodia, "Design and evaluation of deep reinforcement learning for energy saving in open ran," in *2025 IEEE 22nd Consumer Communications & Networking Conference (CCNC)*. IEEE, 2025, pp. 1–6, 9 citations.

[65] G. Gemmi, M. Polese, T. Melodia, and L. Maccari, "Optimizing and Managing Wireless Backhaul for Resilient Next-Generation Cellular Networks," in *20th International Conference on Network and Service Management (CNSM)*, Prague, Czech Republic, November 2024.

[66] H. Cheng, S. D'Oro, R. Gangula, S. Velumani, D. Villa, L. Bonati, M. Polese, T. Melodia, G. Arrobo, and C. Maciocco, "ORANSlice: An Open Source 5G Network Slicing Platform for O-RAN," in *Proceedings of ACM Workshop on Open AI and Open RAN (Open AI RAN)*, Washington, DC, USA, November 2024.

[67] A. Feraudo, S. Maxenti, A. Lacava, P. Bellavista, M. Polese, and T. Melodia, "xDevSM: Streamlining xApp Development With a Flexible Framework for O-RAN E2 Service Models," in *Proceedings of ACM WiNTECH*, Washington, DC, USA, November 2024.

[68] L. Bonati, R. Shirkhani, C. Fiandrino, S. Maxenti, S. D'Oro, M. Polese, and T. Melodia, "Twinning Commercial Network Traces on Experimental Open RAN Platforms," in *Proceedings of ACM WiNTECH*, Washington, DC, USA, November 2024, 1 citation.

[69] T. V. Ngo, M. V. Ngo, B. Chen, G. Gemmi, E. Baena, M. Polese, T. Melodia, W. Chien, and T. Quek, "Consistent and Repeatable Testing of O-RAN Distributed Unit (O-DU) across Continents," in *First Workshop on Research and Innovation in Testing and Integration for Open Radio Access Networks (RitiRAN) - co-located with IEEE VTC Fall 2024*, 2024.

[70] G. Gemmi, M. Polese, P. Johari, S. Maxenti, M. Seltser, and T. Melodia, "Open6G OTIC: A Blueprint for Programmable O-RAN and 3GPP Testing Infrastructure," in *First Workshop on Research and Innovation in Testing and Integration for Open Radio Access Networks (RitiRAN) - co-located with IEEE VTC Fall 2024*, 2024, 2 citations.

[71] A. Lacava, T. Pietrosanti, M. Polese, F. Cuomo, and T. Melodia, "Enabling online reinforcement learning training for open ran," in *2024 IFIP Networking Conference (IFIP Networking)*. IEEE, 2024, pp. 577–582, 4 citations.

[72] R. Gangula, A. Lacava, M. Polese, S. D'Oro, L. Bonati, F. Kaltenberger, P. Johari, and T. Melodia, "Demo: Listen-while-talking: Toward dapp-based real-time spectrum sharing in o-ran," in *Proceedings of IEEE MILCOM*, 2024, 5 citations.

[73] F. Klement, A. Brighente, M. Polese, M. Conti, and S. Katzenbeisser, "Securing the open ran infrastructure: Exploring vulnerabilities in kubernetes deployments," in *2024 IEEE 10th International Conference on Network Softwarization (NetSoft)*, 2024, pp. 185–189, 10 citations.

[74] G. Gemmi, P. Johari, P. Casari, M. Polese, T. Melodia, and M. Segata, "Colossumo: Evaluating cooperative driving applications with colosseum," in *2024 IEEE Vehicular Networking Conference (VNC)*, 2024, pp. 97–100, 6 citations.

[75] P. Testolina, M. Polese, P. Johari, and T. Melodia, "Boston Twin: the Boston Digital Twin for Ray-Tracing in 6G Networks," in *Proceedings of the 15th ACM Multimedia Systems Conference*, 2024, pp. 441–447, 31 citation.

[76] D. Villa, I. Khan, F. Kaltenberger, N. Hedberg, R. S. Da Silva, A. Kelkar, C. Dick, S. Basagni, J. M. Jornet, T. Melodia *et al.*, "An Open, Programmable, Multi-vendor 5G O-RAN Testbed with NVIDIA ARC and OpenAir-Interface," in *IEEE INFOCOM 2024-IEEE Conference on Computer Communications Workshops (INFOCOM WKSHPS)*. IEEE, 2024, pp. 1–6, 36 citations.

[77] S. Maxenti, S. D'Oro, L. Bonati, M. Polese, A. Capone, and T. Melodia, "ScalO-RAN: Energy-aware Network Intelligence Scaling in Open RAN," in *Proc. of IEEE INFOCOM*, 2024, 18 citations.

[78] E. Oughton, G. Geraci, M. Polese, V. Shah, D. Bubley, and S. Blue, "Prospective Evaluation of Wireless Broadband in the Peak Smartphone Era: 6G versus Wi-Fi 7 and 8," in *Available at SSRN 4632857*, 2023, 18 citations.

[79] C. Fiandrino, L. Bonati, S. D'Oro, M. Polese, T. Melodia, and J. Widmer, "EXPLORA: AI/ML EXPLainability for the Open RAN," *Proc. ACM Netw.*, vol. 1, no. CoNEXT3, nov 2023, 38 citations.

[80] G. Gemmi, M. Elkael, M. Polese, L. Maccari, H. Castel-Taleb, and T. Melodia, "Joint Routing and Energy Optimization for Integrated Access and Backhaul with Open RAN," in *IEEE Globecom*, 2023, 12 citations. [Online]. Available: https://arxiv.org/pdf/2309.05059

[81] M. Tsampazi, S. D'Oro, M. Polese, L. Bonati, G. Poitau, M. Healy, and T. Melodia, "A Comparative Analysis of Deep Reinforcement Learning-based xApps in O-RAN," in *IEEE Globecom*, 2023, 19 citations. [Online]. Available: https://arxiv.org/pdf/2309.05621.pdf

[82] E. Moro, M. Polese, A. Capone, and T. Melodia, "An Open RAN Framework for the Dynamic Control of 5G Service Level Agreements," in *IEEE NFV-SDN*, 2023, 16 citations. [Online]. Available: https://arxiv.org/abs/2309.07508

[83] A. Lacava, M. Bordin, M. Polese, R. Sivaraj, T. Zugno, F. Cuomo, and T. Melodia, "ns-O-RAN: Simulating O-RAN 5G Systems in ns-3," in *Proceedings of the 2023 Workshop on Ns-3*, ser. WNS3 '23. Association for Computing Machinery, 2023, pp. 35–44, 42 citations.

[84] M. Pagin, S. Lagén, B. Bojovic, M. Polese, and M. Zorzi, "Improving the Efficiency of MIMO Simulations in ns-3," in *Proceedings of the 2023 Workshop on Ns-3*, ser. WNS3 '23. Association for Computing Machinery, 2023, pp. 1–9, 7 citations.

[85] A. A. Gargari, M. Pagin, A. Ortiz, N. M. Gholian, M. Polese, and M. Zorzi, "Demo:[SeBaSi] system-level Integrated Access and Backhaul simulator for self-backhauling," in *IEEE 24th International Symposium on a World of Wireless, Mobile and Multimedia Networks (WoWMoM)*, 2023-06, pp. 355–357, 2 citations.

[86] E. Moro, G. Gemmi, M. Polese, L. Maccari, A. Capone, and T. Melodia, "Toward Open Integrated Access and Backhaul with O-RAN," in *21st Mediterranean Communication and Computer Networking Conference (MedComNet)*, 2023, pp. 61–69, 14 citations.

[87] C. P. Robinson, L. Bonati, T. Van Nieuwstadt, T. Reiss, P. Johari, M. Polese, H. Nguyen, C. Watson, and T. Melodia, "eSWORD: Implementation of Wireless Jamming Attacks in a Real-World Emulated Network," in *IEEE Wireless Communications and Networking Conference (WCNC)*, 2023, pp. 1–6, 5 citations.

[88] A. A. Gargari, M. Pagin, M. Polese, and M. Zorzi, "6G Integrated Access and Backhaul Networks with Sub-Terahertz Links," in *18th Wireless On-Demand Network Systems and Services Conference (WONS)*, 2023, pp. 13–19, 15 citations.

[89] S. D'Oro, L. Bonati, M. Polese, and T. Melodia, "OrchestRAN: Network Automation through Orchestrated Intelligence in the Open RAN," in *IEEE Conference on Computer Communications*, May 2022, **129 citations**.

[90] L. Bonati, M. Polese, S. D'Oro, S. Basagni, and T. Melodia, "OpenRAN Gym: An Open Toolbox for Data Collection and Experimentation with AI in O-RAN," in *Proc. of IEEE WCNC Workshop on Open RAN Architecture for 5G Evolution and 6G*, Apr 2022, **67 citations**.

[91] ——, "Intelligent Closed-loop RAN Control with xApps in OpenRAN Gym," in *Proceedings of European Wireless 2022*, Sept 2022, 27 citations.

[92] P. Sen, J. Hall, M. Polese, V. Petrov, D. Bodet, F. Restuccia, T. Melodia, J. M. Jornet, "Terahertz Communications Can Work in Rain and Snow: Impact of Adverse Weather Conditions on Channels at 140 GHz," in *Proceedings of the 66th ACM Workshop on Millimeter-Wave and Terahertz Networks and Sensing Systems*, ser. mmNets '22, 2022, 37 citations.

[93] E. Moro, M. Polese, I. Filippini, S. Basagni, A. Capone, T. Melodia, "IABEST: An Integrated Access and Backhaul 5G Testbed for Large-scale Experimentation," in *Proc. of ACM MobiCom Demos*, 2022, 6 citations.

[94] M. Bordin, M. Giordani, M. Polese, T. Melodia, and M. Zorzi, "Autonomous driving from the sky: Design and end-to-end performance evaluation," in *IEEE Globecom Workshops (GC Wkshps)*, 2022, pp. 1610–1615, 6 citations.

[95] N. N. Santhi, M. Polese, and T. Melodia, "An End-to-End Programmable Testbed for the Experimental Evaluation of Video Streaming at mmWaves," in *IEEE Globecom Workshops (GC Wkshps)*, 2022, pp. 124–129, 2 citations.

[96] F. Gomez-Cuba, T. Zugno, J. Kim, M. Polese, S. Bahk, and M. Zorzi, "Full-stack Hybrid Beamforming in mmWave 5G Networks," in *Proc. of the 19th Mediterranean Communication and Computer Networking Conference (MedComNet)*, 2021, 3 citations.

[97] M. Polese, F. Restuccia, and T. Melodia, "DeepBeam: Deep Waveform Learning for Coordination-Free Beam Management in mmWave Networks," 2021, **57 citations**.

[98] T. Melodia, S. Basagni, K. R. Chowdhury, A. Gosain, M. Polese, P. Johari, and L. Bonati, "Colosseum, the World's Largest Wireless Network Emulator," in *Proceedings of ACM MobiCom [Tutorial]*, Oct 2021, 28 citations.

[99] A. A. Gargari, M. Polese, and M. Zorzi, "Full-Stack Comparison of Channel Models for Networks above 100 GHz in an Indoor Scenario," in *Proceedings of the 5th ACM Workshop on Millimeter-Wave and Terahertz Networks and Sensing Systems*, ser. mmNets '21. Association for Computing Machinery, 2021, 6 citations.

[100] L. Bonati, P. Johari, M. Polese, S. D'Oro, S. Mohanti, M. Tehrani-Moayyed, D. Villa, S. Shrivastava, C. Tassie, K. Yoder, A. Bagga, P. Patel, V. Petkov, M. Seltser, F. Restuccia, A. Gosain, K. R. Chowdhury, S. Basagni,

and T. Melodia, “Colosseum: Large-Scale Wireless Experimentation Through Hardware-in-the-Loop Network Emulation,” in *Proc. of IEEE Intl. Symp. on Dynamic Spectrum Access Networks (DySPAN)*, Dec 2021, **164 citations**.

[101] P. Testolina, M. Lecci, M. Polese, M. Giordani, and M. Zorzi, “Scalable and Accurate Modeling of the Millimeter Wave Channel,” in *Proc. of the IEEE Intl. Conf. on Computing, Networking and Communications (ICNC)*, 2020, 17 citations.

[102] M. Lecci, P. Testolina, M. Giordani, M. Polese, T. Ropitault, C. Gentile, N. Varshney, A. Bodi, and M. Zorzi, “Simplified Ray Tracing for the Millimeter Wave Channel: A Performance Evaluation,” in *Proc. of the Workshop on Information Theory and Applications (ITA)*, 2020, **55 citations**.

[103] T. Zugno, M. Polese, N. Patriciello, B. Bojovic, S. Lagen, and M. Zorzi, “Implementation of A Spatial Channel Model for ns-3,” in *Proc. of the Workshop on ns-3 (WNS3)*, 2020, **75 citations**.

[104] M. Drago, T. Zugno, M. Polese, M. Giordani, and M. Zorzi, “MilliCar - An ns-3 Module for mmWave NR V2X Networks,” in *Proc. of the Workshop on ns-3 (WNS3)*, 2020, **66 citations**.

[105] M. Pagin, F. Agostini, T. Zugno, M. Polese, and M. Zorzi, “Enabling RAN Slicing Through Carrier Aggregation in mmWave Cellular Networks,” 2020, 9 citations.

[106] M. Boschiero, M. Giordani, M. Polese, and M. Zorzi, “Coverage Analysis of UAVs in Millimeter Wave Networks: A Stochastic Geometry Approach,” in *Proc. of the 16th Intl Wireless Communications and Mobile Computing Conference (IWCMC 2020)*, June 2020, 34 citations.

[107] M. Polese, L. Bertizzolo, L. Bonati, A. Gosain, and T. Melodia, “An experimental mmwave channel model for uav-to-uav communications,” in *Proc. of 4th ACM Workshop on Millimeter-wave Networks and Sensing Systems (mmNets)*, Sep 2020, **61 citation**.

[108] S. D’Oro, L. Bonati, F. Restuccia, M. Polese, M. Zorzi, and T. Melodia, “SI-EDGE: Network Slicing at the Edge,” 2020, **79 citations**.

[109] T. Zugno, M. Drago, M. Giordani, M. Polese, and M. Zorzi, “NR V2X Communications at Millimeter Waves: An End-to-End Performance Evaluation,” in *IEEE Global Communications Conference (GLOBECOM)*, 2020, 27 citations.

[110] M. Lecci, M. Polese, C. Lai, J. Wang, C. Gentile, N. Golmie, and M. Zorzi, “Quasi-Deterministic Channel Model for mmWaves: Mathematical Formalization and Validation,” in *IEEE Global Communications Conference (GLOBECOM)*, 2020, 32 citations.

[111] U. Paro, F. Chiariotti, A. A. Deshpande, M. Polese, A. Zanella, and M. Zorzi, “Extending the ns-3 QUIC Module,” in *Proceedings of the 23rd International ACM Conference on Modeling, Analysis and Simulation of Wireless and Mobile Systems*, ser. MSWiM ’20. Association for Computing Machinery, 2020, pp. 19–26, 13 citations.

[112] 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, 2019, 5 citations.

[113] W. Xia, M. Polese, M. Mezzavilla, G. Loianno, S. Rangan, and M. Zorzi, “Millimeter Wave Remote UAV Control and Communications for Public Safety Scenarios,” in *Proceedings of the 1st International Workshop on Internet of Autonomous Unmanned Vehicles*, ser. IAUV ’19, 2019, **49 citations**.

[114] M. Polese, T. Zugno, and M. Zorzi, “Implementation of Reference Public Safety Scenarios in ns-3,” in *Proceedings of the 2019 Workshop on ns-3*, ser. WNS3 2019. ACM, 2019, pp. 73–80, 3 citations.

[115] A. De Biasio, F. Chiariotti, M. Polese, A. Zanella, and M. Zorzi, "A QUIC Implementation for ns-3," in *Proceedings of the Workshop on ns-3*, ser. WNS3 2019. ACM, 2019, pp. 1–8, 35 citations.

[116] T. Zugno, M. Polese, M. Lecci, and M. Zorzi, "Simulation of Next-generation Cellular Networks with ns-3: Open Challenges and New Directions," in *Proceedings of the 2019 Workshop on Next-Generation Wireless with ns-3*, ser. WNGW 2019. ACM, 2019, pp. 38–41, 24 citations.

[117] M. Polese, F. Restuccia, A. Gosain, J. Jornet, S. Bhardwaj, V. Ariyarathna, S. Mandal, K. Zheng, A. Dhananjay, M. Mezzavilla, J. Buckwalter, M. Rodwell, X. Wang, M. Zorzi, A. Madanayake, and T. Melodia, "MillimeTera: Toward A Large-Scale Open-Source mmWave and Terahertz Experimental Testbed," in *Proceedings of the 3rd ACM Workshop on Millimeter-Wave Networks and Sensing Systems*, ser. mmNets '19. ACM, 2019, 39 citations.

[118] L. Bertizzolo, M. Polese, L. Bonati, A. Gosain, M. Zorzi, and T. Melodia, "mmBAC: Location-aided mmWave Backhaul Management for UAV-based Aerial Cells," in *Proceedings of the 3rd ACM Workshop on Millimeter-Wave Networks and Sensing Systems*, ser. mmNets '19. ACM, 2019, 30 citations.

[119] M. Drago, M. Polese, S. Kucera, D. Kozlov, V. Kirillov, and M. Zorzi, "QoS Provisioning in 60 GHz Communications by Physical and Transport Layer Coordination," in *IEEE 16th International Conference on Mobile Ad Hoc and Sensor Systems (MASS)*, Nov 2019, 3 citations.

[120] K. Zheng, A. Dhananjay, M. Mezzavilla, A. Madanayake, S. Bharadwaj, V. Ariyarathna, A. Gosain, T. Melodia, F. Restuccia, J. Jornet, M. Polese, M. Zorzi, J. Buckwalter, M. Rodwell, S. Mandal, X. Wang, J. Haarla, and V. Semkin, "Software-defined radios to accelerate mmwave wireless innovation," in *Proc. of the IEEE Intl. Symp. on Dynamic Spectrum Access Networks Workshops (DySPAN)*, 2019-11, pp. 1–4, 16 citations.

[121] 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)*, 2018-03, pp. 508–512, 39 citations.

[122] 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. ACM, 2018, pp. 45–52, 23 citations.

[123] M. Polese and M. Zorzi, "Impact of Channel Models on the End-to-End Performance of Mmwave Cellular Networks," in *IEEE 19th International Workshop on Signal Processing Advances in Wireless Communications (SPAWC)*, 2018-06, pp. 1–5, 29 citations.

[124] M. Giordani, M. Polese, A. Roy, D. Castor, and M. Zorzi, "Initial access frameworks for 3GPP NR at mmWave frequencies," in *17th Annual Mediterranean Ad Hoc Networking Workshop (Med-Hoc-Net)*, 2018-06, pp. 1–8, 23 citations.

[125] 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)*, 2018-09, pp. 1–7, **90 citations**.

[126] 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, **94 citations**.

[127] 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, pp. 1–6, 34 citations.

[128] F. Chiariotti, D. D. Testa, M. Polese, A. Zanella, G. M. D. Nunzio, and M. Zorzi, "Learning methods for long-term channel gain prediction in wireless networks," in *International Conference on Computing, Networking and Communications (ICNC)*, Jan 2017, pp. 162–166, 13 citations.

[129] M. Polese, R. Jana, and M. Zorzi, "TCP in 5G mmWave Networks: Link Level Retransmissions and MP-TCP," in *IEEE Conference on Computer Communications Workshops (INFOCOM WKSHPS)*, May 2017, **75 citations**.

[130] 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, 7 citations.

[131] 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 Workshop on ns-3*. ACM, 2017, pp. 71–78, **58 citations**.

[132] 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)*, June 2017, 43 citations.

[133] 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)*, Aug 2017, 16 citations.

[134] 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. ACM, 2017, pp. 11–16, 37 citations.

[135] 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 *IEEE Global Communications Conference (GLOBECOM)*, 2017, pp. 1–6, 9 citations.

[136] 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 *51st Asilomar Conference on Signals, Systems, and Computers*, Oct 2017, pp. 951–957, **49 citations**.

[137] 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. ACM, 2017, pp. 44–49, 3 citations.

[138] M. Polese, M. Centenaro, A. Zanella, and M. Zorzi, "M2M massive access in LTE: RACH performance evaluation in a Smart City scenario," in *IEEE International Conference on Communications (ICC)*, May 2016, pp. 1–6, **56 citations**.

[139] 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, 2016, pp. 118–123, **59 citations**.

Book Chapters

[140] A. Shahid, A. Kliks, A. Al-Tahmeesschi, A. Elbakary, A. Nikou, A. Maatouk, A. Mokh, A. Kazemi, A. De Domenico, A. Karapantelakis, M. Polese *et al.*, "Large-scale ai in telecom: Charting the roadmap for innovation, scalability, and enhanced digital experiences," *arXiv preprint arXiv:2503.04184*, 2025, 29 citations.

[141] M. Polese, M. Giordani, M. Mezzavilla, S. Rangan, and M. Zorzi, *6G Enabling Technologies*. Cham: Springer International Publishing, 2021, pp. 25–41, 13 citations.

[142] 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, 16 citations.

[143] M. Giordani, M. Polese, A. Laya, E. Bertin, and M. Zorzi, "6G Drivers for B2B Market: E2E Services and Use Cases," *Shaping Future 6G Networks: Needs, Impacts and Technologies*, p. 13, 2021, 7 citations.

TECHNOLOGY TRANSFER

I am passionate about transitioning cutting-edge lab research to products and services that can advance production wireless networks.

zTouch Networks, Inc. | *Boston, MA*

- Co-founder 2022 - Present
- zTouch Networks is creating a cellular network operating systems, to automate and simplify cellular operations. A Northeastern spinoff, it currently engages with the U.K. Digital Catapult's SONIC Labs Technology Access Programme (TAP), RedHat, Amini, Deutsche Telekom, Ekiva, Rakuten Symphony, A5G. zTouch Networks is part of the NVIDIA Inception program. `ztouchnet.com`

Open6G at Northeastern | *Boston, MA*

- Oversight, responsible for bootstrapping, operations 2023 - Present
- Successfully led the establishment of a technology transfer hub focused on Open RAN at Northeastern. A one-stop-shop for Open RAN innovation, it focuses on end-to-end proofs of concept and high TRL research, testing and integration, and system integration. The Open Testing and Integration Center (OTIC) is officially recognized by the O-RAN ALLIANCE and is the first one in the U.S. to have released a certificate for an O-RAN RU. `open6g.us`

PATENTS, POLICY, AND STANDARDIZATION

Engage with policy makers and industry organizations to maximize research impact and outreach.

- Active participation to the O-RAN ALLIANCE and the AI-RAN Alliance:
  - **AI-RAN Working Group 2 (WG2) AI-and-RAN Chair**, elected position. Recognized as a top contributor for the AI-RAN Alliance, leading tasks on architecture and AI/ML workflows in AI-RAN Working Groups.
  - Editor and rapporteur for an O-RAN ALLIANCE nGRG research item on dApps, the real time extension of the O-RAN architecture we proposed in [33]. A first research report has been published with contributions from NVIDIA, Mavenir, Qualcomm, MITRE, and reviews from Ericsson, Jio, Samsung, Keysight, Verizon: `tinyurl.com/oran-dapps-report`. The topic was presented at the O-RAN all members meeting in October 2025, with support from Reliance Jio, NVIDIA, MITRE, BAH, DeepSig, Digital Catapult, Mavenir, Tiami Networks, Rimedo Labs, HighStreet Technologies, IMDEA, PUT, U Tokyo.
  - Active contributions to O-RAN ALLIANCE Working Groups on use cases and architecture.
- Co-inventor of three awarded patents and of 19 patent applications in the area of Open RAN systems, digital twins, and beam management.
- Contributed to several proceedings and requests for comments from the FCC and the NTIA.

OPEN-SOURCE SOFTWARE AND EXPERIMENTAL TESTBEDS

I have led and contributed to multiple projects that have open sourced software for experimental research and network simulation, and to the development, operations, and extension of community research testbeds.

- **OpenRAN Gym** `openrangym.com`
  Open-source software `github.com/o-ran-sc/sim-ns3-o-ran-e2`
  Developed OpenRAN Gym, a framework for the design and testing of intelligent closed-loop control solutions for the O-RAN systems [29]. It comes with a near-real-time RAN Intelligent Controller (RIC) and tools for data

collection and control of multiple RAN implementations, either with software-defined stacks (OAI and srsLTE) or simulated (ns-3, through the ns-O-RAN extension). The OpenRAN Gym website counts more than 3000 visits per month, and the framework is used in tens of experiments in Colosseum.
The most recent extensions of OpenRAN Gym include open-source support of dApps for OpenAirInterface and NVIDIA Aerial, and a flexible multi-RAN xApp framework.

- **ns-3 Modules** `github.com/nyuwireless-unipd/ns3-mmwave`
  Open-source software `https://github.com/signetlabdei/?q=ns-3&sort=stargazers`
  Contributed to releases 29, 30, and 31 of the ns-3 module, and to the design of the 5G channel model implementation for the simulator [103].
  Led and contributed to several modules, including the first 5G module for ns-3 [51], a QUIC implementation, and a vehicular simulator. The repositories for these tools are cloned hundreds of times every week.
- **Colosseum, X5G, and Northeastern Private 5G Testbeds** `colosseum.net`
  Community testbeds `https://tinyurl.com/wiot-p5g`
  Led and contributed to the development and operations of open testbeds for wireless experimental research. I am part of the Colosseum team, extending and maintaining the world's largest wireless network emulator with hardware in the loop, specifically for the integration of new features (GPUs, new hardware, new emulation capabilities) and the development of community use cases. Colosseum is open to the public and counts 644 users across 136 teams. I am also leading the deployment of a private 5G network at Northeastern, based on the X5G testbed and a fully automated RAN management framework [76].

TEACHING EXPERIENCE

Northeastern University | Boston, MA

- Instructor, EECE 5698 Special Topic: Network Programming — Fall semester, 2020 - 2023
  5/5 in instructor effectiveness in the 2022, 2023 Teacher Rating And Course Evaluation (TRACE).
- Supervisor, EECE 4991 Research — Spring semester, 2023, Fall semester 2025
  Supervised undergraduate and master students in their first wireless research experience.
- Future Faculty Program — 2020 - present
  Class observation, curriculum development, and participation to teaching workshops and conferences.
- Guest lecturer — 2020 - present
  Delivered lectures on 5G and Open RAN across multiple Northeastern University campuses.

University of Padova | Padova, Italy

- Adjunct Professor, Programming for Telecommunications — October 2019 - September 2020

Tutorials and short courses at various conferences, including IEEE CCNC 2021, ACM MobiCom 2021, IEEE NetSoft 2022, IEEE Globecom 2022, ACM MobiCom 2023, IEEE DySPAN 2024, Lipari Summer School 2024, and online webinars for IEEE and ITU, among others.

Mentor for the ns-3 project in the Google Code-in 2018, 2019, 2022 (introducing pre-university students to open source development) and Google Summer of Code 2022.

SERVICE

Editor

- Editor, Elsevier Computer Networks — 2023 - present
- Associate Technical Editor, IEEE Communications Magazine — 2021 - present
- Guest Editor, Advances in wireless networks simulation, Elsevier Computer Networks — 2024
- Guest Editor, IEEE Journal on Selected Areas in Communications (JSAC), Special Issue on Open RAN — 2022 - 2024
- Guest Editor, IEEE Communications Magazine Feature Topic on Transport Layer Innovations for Future Net-

works

2021

Conference Chairing

- **TPC Co-Chair:** EuCNC & 6G Summit 2025 (AI4C track), European Wireless 2025, IEEE/IFIP WONS 2024, ACM WiNTECH 2023, ACM Workshop on ns-3 (WNS3) 2021-2022
- **Co-Chair/Organizer:** IEEE VTC RitiRAN 2024, IEEE Globecom BRAIN 2024, IEEE Globecom NextGenRAN 2022, Open5G Forum (sponsored by ACM SigMobile community grant) 2021-2022
- **Track Co-Chair:** IEEE VTC Spring 2025, 2026
- **Tutorial Co-Chair:** IEEE ISCC 2025, 2026, IEEE VTC Fall 2026
- **Demo Chair:** IEEE LANMAN 2024
- **Finance Co-Chair:** IEEE WoWMoM 2023

Technical Program Committee Member

- ACM CoNEXT 2025-2026, IEEE/IFIP WONS 2022-2025, IEEE CCNC 2021-2026, IEEE ICC (multiple symposia) 2022-2026, IEEE WCNC 2024-2026, IEEE ICNC 2024-2025, IEEE NetSoft 2024-2025, ACM WiNTECH 2024, IEEE Globecom (multiple symposia) 2023-2025, IEEE PIMRC 2023-2025, IEEE HPSR 2023-2025, IEEE LANMAN 2023, IEEE WoWMoM 2023, ACM WNS3 2019-2023, IEEE MASS 2021-2022, ACM MobiArch 2021-2024

Reviewer

- Journals/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, Elsevier Computer Networks, European Wireless, IEEE 5G-WF, IEEE Globecom, IEEE ICC, IEEE ICNC, IEEE LCN, IEEE VTC, IEEE WCNC
- Proposals: EIC Pathfinder Open 2025 (Individual Evaluator)

Thesis Committees

- Pre-Examiner for multiple thesis at the University of Oulu, Tampere University, and the University of Adelaide, 2025
- Committee Member for Gerard Bou Capovilla, Jacob Hall, Master Thesis, Northeastern University, 2022-2024
- Co-supervised multiple M.Sc. thesis at the University of Padova, 2018-2022

Professional Societies Committee Service

- AMS Committee on Radio Frequency Allocations, Member, 2022-2027
- IEEE ComSoc Young Professionals, Member at Large, 2019-2021, 2022-2024

Senior Member of the IEEE, IEEE ComSoc. Member of ACM, SigMobile, and the American Meteorological Society (AMS).

Other

I hold the Abilitazione Scientifica Nazionale (Italian national scientific habilitation) for Associate Professor in the Telecommunications area (09/F2) (valid from June 11, 2021).

PRESS

- Press on the completion of the project with the O-RAN ALLIANCE, May 2025. `https://www.lightreading.com/open-ran/o-ran-alliance-boasts-of-digital-twins`
- News comment on airport radar technology for CNN, May 9, 2025. `https://www.cnn.com/2025/05/09/us/can-dept-of-transportation-and-sean-duffy-fix-air-traffic-control-system`
- News comment on interference for Axios, April 14, 2025. `https://www.axios.com/local/boston/2025/04/`

14/carplay-android-auto-dead-zones-wifi-interference

- Open RAN intelligent control—from vision to reality, RCR Wireless News, September 30, 2024. https://tinyurl.com/polese-ric-rcr
- Northeastern Leads Open RAN Research Using NVIDIA ARC-OTA for Innovation, Development, Validation, and Benchmarking, interview with NVIDIA Tech Talk, March 2024. https://www.nvidia.com/en-us/on-demand/session/other2024-arcradar/
- What caused the widespread AT&T outages?, Northeastern Global News, February 22, 2024. https://news.northeastern.edu/2024/02/22/att-outage-possible-cause/
- Everything you need to know about the 5G revolution—and how it will usher in 6G, Northeastern Global News, August 9, 2023. https://news.northeastern.edu/2023/08/09/5g-to-6g-transformation/
- Climate Monitoring and 6G Must Learn to Coexist, IEEE Spectrum, July 25, 2023 (interview). https://spectrum.ieee.org/climate-monitoring-satellites
- ns-O-RAN, October 2022 https://tinyurl.com/jbrb88jx and https://tinyurl.com/24th47ja
- The Future of 6G Wireless Could Be Closer Than You Think, News Northeastern, May 26, 2022. http://news.northeastern.edu/2022/05/26/6g-wireless-future/
- Northeastern University demos AI-based O-RAN at MWC LA, LightReading, October 26, 2021. https://www.lightreading.com/open-ran/northeastern-university-demos-ai-based-o-ran-at-mwc-la/d/d-id/773046
- ComSoc YouTube series on 6G papers, for [45], June 2021 https://www.youtube.com/watch?v=2npTuUHi78w