Michele Polese

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PROFILE

Technical leader in AI-driven wireless networks, AI-RAN, Open RAN, and 5G/6G, working at the point where research becomes product. Technical Director of the Institute for Intelligent Networked Systems at Northeastern University, elected Chair of the AI-RAN Alliance AI-and-RAN Working Group, and co-founder of zTouch Networks, a Northeastern spinoff building a cellular network operating system. Research I led on dApps and real-time RAN control now ships inside the NVIDIA 5G Aerial stack and other commercial protocol stacks; the Open RAN testing hub I established is the first center in the U.S. to certify an O-RAN radio unit.

Funding: $22.1M+ as PI/Co-PI • **Spinoff:** co-founder, zTouch Networks • **Patents:** 4 awarded, 19+ filed • **Standards:** AI-RAN Alliance WG chair
Publications: 160+ • **Citations:** 15,210 • **h-index:** 51 • tinyurl.com/polese

EXPERIENCE

Northeastern University | *Institute for Intelligent Networked Systems, ECE* | Boston, MA 2020 – Present

- **Technical Director**, Institute for Intelligent Networked Systems 2026 – Present
  Set and drive the technical agenda of the institute across AI-RAN, Open RAN, spectrum, and large-scale wireless experimentation, including its industry and government programs.
- **Research Assistant Professor** 2023 – Present
  Lead a research portfolio on open, programmable, AI-native networks; build and run the platforms, partnerships, and funded programs behind it.
- **Principal Research Scientist** / Associate Research Scientist 2020 – 2023
  Built the Open RAN research and prototyping line that grew into Open6G and the Northeastern private 5G deployment.

zTouch Networks, Inc. | Boston, MA 2022 – Present

- **Co-founder** — cellular network operating system automating and simplifying network operations. NVIDIA Inception company; winner of the Deutsche Telekom/T-Mobile T-Challenge 2026 and an AI-RAN Alliance Innovation Award.

AT&T Labs | Bedminster, NJ 2018

- Visiting researcher — data-driven architectures for edge machine learning in operator networks.

Earlier | NYU Wireless (2017); Consorzio Futuro in Ricerca, consultant (2017–2019)

IMPACT AND TECHNOLOGY TRANSFER

Research shipping in commercial products. dApps — the real-time extension of the O-RAN architecture my team proposed — and the E3 interface that supports them are now part of major commercial protocol stacks, including NVIDIA 5G Aerial, Cohere, and Radisys.

Open6G OTIC, Northeastern (open6g.us). Established and run a one-stop Open RAN technology transfer hub covering end-to-end proofs of concept, high-TRL integration, and interoperability testing. Officially recognized by the O-RAN ALLIANCE and the first Open Testing and Integration Center in the U.S. to issue a certificate for an O-RAN radio unit.

zTouch Networks (co-founder) (ztouchnet.com). Cellular network operating system for automated network operations. Engagements with Deutsche Telekom, Rakuten Symphony, Red Hat, A5G, Ekiva, Amini, and the U.K. Digital Catapult SONIC Labs programme; NVIDIA Inception member; T-Challenge 2026 and AI-RAN Alliance Innovation Award winner.

Patents. 4 awarded U.S. patents and 19+ further applications in Open RAN control, digital twins, and beam management — including *Intelligence and Learning in O-RAN for 5G and 6G Cellular Networks* (US 12,127,059) and *Open RAN Adapter for Use of Open RAN Technologies on Legacy RAN Systems* (US 12,489,690).

STANDARDS AND ECOSYSTEM LEADERSHIP

AI-RAN Alliance. Elected **Chair of Working Group 2, AI-and-RAN** (2025–2028). Recognized top contributor to the alliance; lead tasks on AI-RAN architecture and AI/ML workflows.

O-RAN ALLIANCE. Editor and rapporteur of the nGRG research item on dApps, delivering a research report with contributions from NVIDIA, Mavenir, Qualcomm, and MITRE, and reviews from Ericsson, Jio, Samsung, Keysight, and Verizon. Presented at

the O-RAN all-members meeting (2025) with support from Reliance Jio, NVIDIA, MITRE, Booz Allen Hamilton, DeepSig, Digital Catapult, Mavenir, and others. Ongoing contributions to the use case and architecture working groups.

Policy. Contributions to FCC and NTIA proceedings and requests for comments; member of the American Meteorological Society Committee on Radio Frequency Allocations (2022–2027).

FUNDED PROGRAMS

$22.1M+ awarded as PI or Co-PI, plus $2M+ as senior personnel, across federal (NSF, OUSD R&E FutureG, NTIA, National Spectrum Consortium), state, and industry-subcontracted programs. Selected programs:

- **Open6G** — O-RAN compliant open-source protocol stacks for the softwarized edge. OUSD R&E, FutureG Office. $5.3M to date, Co-PI, 2022–2028.
- **SpectraNet** — ubiquitous, secure, millisecond-level spectrum sharing with RAN-as-a-sensor. National Spectrum Consortium / OUSD R&E. $2.5M Northeastern share, Northeastern PI, 2026–2027.
- **AutoRAN** — automated end-to-end continuous testing for open, disaggregated cellular systems. NTIA Public Wireless Supply Chain Innovation Fund. $2M, PI, 2024–2026.
- **DigiRAN / TENORAN** — high-fidelity digital twins for Open RAN interoperability, security, and energy-efficiency testing. NTIA. $2M each, Co-PI, 2023–2026.
- **CROSSComm (NSF POSE Phase II)** — building the open-source community for intelligent Future-G networks. NSF. $1.5M, PI, 2025–2027.
- **ACCoRD** — Open RAN compatibility and commercialization consortium, under AT&T and Verizon subcontracts. NTIA. $1M, Co-PI, 2024–2028.
- **Wireless Heart of America (WHOA)** — Open RAN supply chain innovation with Abside Networks. NTIA. $1.5M, Co-PI, 2025–2027.
- **From Open RAN to Open Spectrum** — sharing spectrum, services, and infrastructure. NSF. $750k, PI, 2025–2028.
- **Open6G Hub** — Open RAN hub for AI-driven connectivity in Massachusetts. MassTech Collaborative. $1.52M, Co-PI, 2023–2024.

Further active awards with NSF and MITRE on spectrum sharing and national radio dynamic zones; an additional $20M+ in proposals pending with NSF, OUSD R&E, the National Spectrum Consortium, Lockheed Martin, and Booz Allen Hamilton.

OPEN SOURCE AND PLATFORMS

AgentRAN (github.com/wineslab/agentran). Agentic AI framework for autonomous Open RAN control: a hierarchy of LLM-based agents that turns natural-language operator intent into real-time scheduling, power control, and interference mitigation on software-defined 5G stacks.

OpenRAN Gym (openrangym.com). Framework for designing and testing closed-loop AI control of O-RAN systems, with a near-real-time RIC, data collection, and control of both software-defined (OpenAirInterface, srsLTE) and simulated RANs. 3,000+ monthly visits; used in dozens of Colosseum experiments; recent releases add dApp support for OpenAirInterface and NVIDIA Aerial.

Colosseum, X5G, and Northeastern private 5G (colosseum.net). Part of the team building and operating the world's largest wireless network emulator with hardware in the loop — 644 users across 136 teams — and lead of the campus private 5G deployment built on the X5G multi-vendor O-RAN testbed with a fully automated RAN management framework.

ns-3 — author and maintainer of widely used modules, including the first 5G mmWave module and the 5G spatial channel model shipped in ns-3 releases 29–31; repositories cloned hundreds of times per week.

PUBLICATIONS AND RECOGNITION

160+ peer-reviewed publications (62 journal, 97 conference, 4 book chapters), **15,210 citations**, **h-index 51**; 4 papers above 1,000 citations and 19 above 100. Full list: tinyurl.com/polese. Most cited and most widely referenced work:

- "Understanding O-RAN: Architecture, Interfaces, Algorithms, Security, and Research Challenges," *IEEE Communications Surveys & Tutorials*, 2023 — the reference tutorial on the O-RAN architecture.
- "dApps: Distributed Applications for Real-Time Inference and Control in O-RAN," *IEEE Communications Magazine*, 2022 — now adopted in commercial stacks and in O-RAN ALLIANCE research.
- "End-to-End Simulation of 5G mmWave Networks," *IEEE Communications Surveys & Tutorials*, 2018 — IEEE ComSoc CSIM Best Journal Paper Award.
- "ColO-RAN: Developing Machine Learning-based xApps for Open RAN Closed-loop Control," *IEEE Transactions on Mobile Computing*, 2022.
- "An Open, Programmable, Multi-vendor 5G O-RAN Testbed with NVIDIA ARC and OpenAirInterface," *IEEE INFOCOM Workshops*, 2024 — Best Paper Runner-Up.

Awards: 2022 ISSNAF Young Investigator Award for Computer Science; IEEE ComSoc EMEA Outstanding Young Researcher Award, 2019; best paper awards at CNSM 2024, IEEE VNC 2024, ACM WNS3 2019 and 2020, and IEEE MedComNet 2020; IEEE ComSoc CSIM Best Journal Paper 2019.

COMMUNITY AND SPEAKING

Editorial. Associate Editor, IEEE Transactions on Mobile Computing (2026–); Editor, Elsevier Computer Networks (2023–); Associate Technical Editor, IEEE Communications Magazine (2021–). Guest editor for the IEEE JSAC Special Issue on Open RAN and two further special issues.

Keynotes. ACM WiseML at ACM WiSec 2026 ("Toward Open, Programmable, Intelligent, and Secure AI-RAN"); ENMETH at IEEE CCNC 2025.

Invited talks. 20+ invited talks and seminars since 2022, including MIT, NYU, Cornell, UT Austin, TU Munich, UMass Amherst, Aalborg University, the Alan Turing Institute, Technology Innovation Institute, UNH-IOL, IEEE Industry Connections Open RAN meetings, and O-RAN nGRG workshops.

Tutorials. Conference tutorials and short courses at IEEE CCNC, ACM MobiCom, IEEE NetSoft, IEEE Globecom, IEEE DySPAN, IEEE ICC, and the Lipari Summer School, plus IEEE and ITU webinars.

Events. Organizer of the Open6G+AI Workshop 2026 at Northeastern (open-source AI-RAN ecosystem event with tutorials and a hackathon); TPC co-chair of EuCNC & 6G Summit 2025 (AI4C track), European Wireless 2025, IEEE/IFIP WONS 2024, ACM WiNTECH 2023; program committee member for IEEE INFOCOM, ACM CoNEXT, IEEE ICC, and IEEE Globecom, among others.

Professional. Senior Member, IEEE and IEEE Communications Society; Member, ACM and SIGMOBILE. Italian national scientific habilitation (ASN) for Associate Professor in Telecommunications, 2021.

SELECTED PRESS AND MEDIA

- *Light Reading* — "O-RAN Alliance boasts of digital twins," on the completion of our O-RAN ALLIANCE project, May 2025.
- *CNN* — expert comment on airport radar technology and air traffic control modernization, May 2025.
- *Axios* — expert comment on wireless interference and connectivity dead zones, April 2025.
- *RCR Wireless News* — "Open RAN intelligent control—from vision to reality," September 2024.
- *NVIDIA Tech Talk* — interview on leading Open RAN research with NVIDIA ARC-OTA, March 2024.
- *IEEE Spectrum* — "Climate Monitoring and 6G Must Learn to Coexist," July 2023 (interview).
- *Light Reading* — "Northeastern University demos AI-based O-RAN at MWC LA," October 2021.
- *Northeastern Global News* — commentary on the AT&T outage (2024), the 5G-to-6G transition (2023), and the future of 6G (2022).

EDUCATION

Ph.D., Information Engineering — University of Padova, Italy 2020
M.Sc., Telecommunications Engineering — University of Padova, Italy 2016
B.Sc., Information Engineering — University of Padova, Italy 2014