

Alex Piccioni

Curriculum Vitae

DISIM
University of L'Aquila
☎ (+39) 349 2543567
✉ alex.piccioni@univaq.it
in LinkedIn



Alex Piccioni was born in San Benedetto del Tronto (AP) on April 23, 1992. He obtained his Bachelor's Degree in Information Engineering and his Master's Degree in Telecommunications Engineering with honors from the Department of Information Engineering and Computer Science and Mathematics at the University of L'Aquila, in 2017 and 2019, respectively. In 2023, he earned a Ph.D. in Information Engineering and Computer Science from the same university, where he currently holds a PostDoc research position with a research grant. In recent years, he has co-supervised several bachelor's and master's theses on topics related to his research activities at the university. His work focuses on topics related to the physical layer of communication systems, particularly on the use of new 5G/6G mobile communication systems to provide connectivity to vehicles in Urban Air Mobility scenarios. Additionally, his research includes the analysis of multiconnectivity techniques for secure and reliable communications, the development of Open RAN technologies, and the integration of communication and sensing techniques (Integrated Sensing and Communications) through solutions based on backscatter communications in radar technology. Furthermore, during his Ph.D., as part of the INCIPICT research project, he focused on the development of Software Defined Radio applications for spectral monitoring, localization, and prototypal solutions for new communication standards.

Education

- 2023 **Ph.D., Information and Communications Technology**, *University of L'Aquila*, L'Aquila, Italy.
Thesis: Software-Defined Radio for Spectral Analysis and Integrated Sensing and Communications
- 2019 **M.Sc. Telecommunication Engineering**, *University of L'Aquila*, L'Aquila, Italy.
Thesis: Study, analysis and trial of techniques for wireless transmissions recognition in SDR technology
- 2017 **B.Sc. Information Engineering**, *University of L'Aquila*, L'Aquila, Italy.
Thesis: Study and analysis of Q-algorithm performance in RFID systems

Qualifications

- 2020 **Qualification for the practice of the Information Engineering profession**, *Section A, Session I*, University of L'Aquila.
- 2020 **PF24 Certification**, *Certification issued pursuant to article 3, paragraph 5, of Ministerial Decree 616/2017 for access to the competition for roles as a teacher in secondary schools*, University of L'Aquila.

Research Experience

Aug. 2023 – present **Research Fellow**, *University of L'Aquila*, L'Aquila, Italy

Research activities based on:

- Next-Generation mobile network integration for low-altitudes aerial vehicle connectivity in Urban Air Mobility scenarios with the integration of Non-Terrestrial Networks;
- Analysis of O-RAN solutions for first responders connectivity in disaster scenarios;
- Backscattering communication techniques integration in radar-based remote sensing technologies (Synthetic Aperture Radar) under the paradigm of Integrated Sensing and Communications;
- Analysis and development of multi-connectivity techniques for next-generation mobile networks;
- Development of network sensing techniques and integration of services to support mobile network based on Software-Defined Radio platforms;

- Integration of Software Defined Radio technology in Radio-Frequency Identification systems. Bachelor and Master thesis Co-supervision.

Feb. 2023 – **Research Grant**, *University of L'Aquila*, L'Aquila, Italy

Jul. 2023

Research grant for the project titled "Study and implementation of techniques based on steganography in the context of Software Defined Radio for secure communications" within the University Project House of Emerging Technologies (CTE) *Smart Home of Security Technologies – L'Aquila* (SICURA). The objective was to analyze steganography techniques to integrate secure communications through waveform embedding techniques using Software Defined Radio technology.

Nov. 2019 – **PhD Student**, *University of L'Aquila*, L'Aquila, Italy

Jan. 2023

Research activities in Systems Engineering, Telecommunications, and HW/SW Platforms; development of Software-Defined Radio applications for spectral monitoring, localization, and prototypal solutions for new communication standards; study of radar technologies for the implementation of backscattering communication in Integrated Sensing and Communication scenarios; study of SAR technology, real SAR satellite systems, and ground devices for support applications such as active and passive corner reflectors. Development of basic knowledge in hardware/software development methodologies and an overview of cybersecurity.

2019 **Internship at DEWS Center of Excellence**, *University of L'Aquila*, L'Aquila, Italy

M.Sc. thesis work on Design methodology in SDR environment.

2017 **Internship at University of L'Aquila**, *University of L'Aquila*, L'Aquila, Italy

MB.Sc. thesis work on Laurea Triennale in MAC protocols for RFID systems.

Publications

Journal Articles

- J1 **A. Piccioni**, A. Marotta, C. Rinaldi, and F. Graziosi. Enhancing Mobile Networks for Urban Air Mobility Connectivity. *IEEE Networking Letters*, volume 6, number 2 pages 110–114. IEEE, June 2024, doi: 10.1109/LNET.2024.3390610.
- J2 **A. Piccioni**, A. Marotta, C. Rinaldi, C. Centofanti, K. Kondepu, D. Cassioli, and F. Graziosi. Exploiting O-RAN Neutral Hosting for First Responders Connectivity in Emergency Scenarios. UNDER SECOND REVIEW FOR PUBLICATION TO *Computer Communications*.
- J3 **A. Piccioni**, R. Alesii, F. Santucci, and F. Graziosi. A Testing Framework for Joint Communication and Sensing in Synthetic Aperture Radars. UNDER REVIEW FOR PUBLICATION TO *IEEE Access*.

In Conference Proceedings

- C1 **A. Piccioni**, R. Alesii, F. Santucci, and F. Graziosi. Satellite SAR Testing Framework for Integrated Sensing and Communication In *2024 4th URSI Atlantic Radio Science Meeting (AT-RASC)*, Meloneras, Spain, 2024, doi: 10.46620/URSIATRASC24/OOHR4126.
- C2 **A. Piccioni**, R. Alesii, F. Santucci, and F. Graziosi. SDR SAR Target: Corner Reflector and Communication In *2022 3rd URSI Atlantic and Asia Pacific Radio Science Meeting (AT-AP-RASC)*, Gran Canaria, Spain, 2022, doi: 10.23919/AT-AP-RASC54737.2022.9814344.
- C3 **A. Piccioni**, R. Alesii, F. Santucci, and F. Graziosi. Software-defined Corner Reflector for Satellite SAR Systems In *2022 IEEE Aerospace Conference (AERO)*, Big Sky, MT, USA, 2022, doi: 10.1109/AERO53065.2022.9843608.
- C4 **A. Piccioni**, R. Alesii, F. Santucci, and F. Graziosi. SDR-Based Ground Target for Identification and Tracking through Satellite SAR Systems In *2021 IEEE Aerospace Conference (50100)*, Big Sky, MT, USA, 2021, doi: 10.1109/AERO50100.2021.9438499.
- C5 **A. Piccioni**, A. Marotta, P. Di Marco, and F. Graziosi. Performance Evaluation of Multi-Connectivity for Massive-URLLC in Emergency Scenarios ACCEPTED FOR PUBLICATION In *2024 International Conference on Information and Communication Technologies for Disaster Management (ICT-DM 2024)*, 2024.

- C6 **A. Piccioni**, A. L. Zuriarrain Sosa, R. Alesii, and F. Graziosi. SDR-Based Supporting System for Multimedia Services in Mobile Communication Networks ACCEPTED FOR PUBLICATION In *Next-Generation Multimedia Services at the Edge: Leveraging 5G and Beyond (NGMSE) 2024 Workshop Colocated with the 29th IEEE Symposium on Computers and Communications (ISCC)*, 2024.
- C7 A. K. Subudhi, **A. Piccioni**, G. Venkateswarlu, A. Marotta, F. Graziosi, R. M. Hegde, and K. Kondepu. Performance Evaluation of Scheduling Scheme in O-RAN 5G Network using NS-3 ACCEPTED FOR PUBLICATION In *IEEE Future Networks World Forum 2024*, 2024.
- C8 R. Alesii, D. Cassioli, **A. Piccioni**, and A. F. Molisch. A New Statistical Model of Human-induced Multipath Dynamics in mmWaves Channels ACCEPTED FOR PUBLICATION In *European Wireless 2024*, 2024.
- C9 S. A. Ratti, **A. Piccioni**, A. Marotta, D. Cassioli, and F. Graziosi. Enhancing Mobile Network Security through O-RAN: Architectural Solutions for Physical Layer Attack Detection SUBMITTED FOR PUBLICATION In *2024 IEEE International Conference on Advanced Networks and Telecommunications Systems (ANTS): Early Career Research Forum*, 2024.
- C10 **A. Piccioni**, A. Marotta, C. Rinaldi, and F. Graziosi. Exploiting 6G Networks for Urban Air Mobility Connectivity SUBMITTED FOR PUBLICATION In *IEEE Future Networks World Forum 2024*, 2024.

Editorial and Conference activities

Reviewer Activities

- 2024 – **Reviewer**, *Springer*, Wireless Networks.
present
- 2024 – **Reviewer**, *IEEE*, IEEE Networking Letters.
present
- 2020 – **Reviewer**, *Conference Proceedings*, IEEE ICC, IEEE Globecom, IEEE WCNC, IEEE ISCC, IEEE ANTS, IEEE VTC.
present

Conference & Event Activities

- 2024 **Technical programme committee member**, Next-Generation Multimedia Services at the Edge: Leveraging 5G and Beyond (NGMSE) 2024 Workshop Colocated with the 29th IEEE Symposium on Computers and Communications (ISCC).
- 2023 **Workshop Speaker**, 1ST RESTART Tech Camp on 5G and Open RAN, Rome, Italy.

Awards

- 2022 **Seasonal School Top-Three Student**, *Seasonal School "ARTIST - 5G/6G NETWORKS TRANSFORMING THE DIGITAL SOCIETY"*, Scuola Superiore Sant'Anna, Pisa.

Project activities

- Feb. 2023 – **Smart Home of Security Technologies – L'Aquila SICURA-Casa Intelligente Delle Tecnologie per la Sicurezza—Piano di Investimenti per la Diffusione Della Banda Ultra Larga FSC 2014–2020**, supported by the Italian Government under Grant CUP C19C20000520004, Researcher.
Jul. 2023
- Nov. 2019 – **INCIPICT Innovating City Planning through Information and Communications Technologies**, supported by the Italian Government under CIPE resolution no. 135 (December 21, 2012), Researcher.
Jan. 2023

Teaching

Master's Theses and Bachelor's Theses

- 2024 **Co-advisor**, *Eddy Colangelo*, Performance Evaluation of Enhanced Radio Access Network for Urban Air Mobility Scenarios, B.Sc. Information Engineering.
- 2022 **Co-Advisor**, *Paolo Capanna*, Study and Experimentation of Communication and Sensing Integration, M.Sc. Telecommunications Engineering.
- 2021 **Co-Advisor**, *Michael Passaretti*, Backscattering communication and synthetic aperture radar, M.Sc. Telecommunications Engineering.

Service Activities to the Atheneum

- 2024 **Event organization**, *Organization of the event "Wireless Communications Seminar Tour" for B.Sc. and M.Sc. students with Rohde & Schwarz Italia.*
- 2020 – present **Seminar organization**, *Seminars on Spectral Monitoring, SDR Programming, and Urban Air Mobility.*

Training

- 2023 **IEEE Summer School on "Frontier Technologies for Space 2.0 Communications"**, IEEE Aerospace and Electronic Systems Society "Glue Technologies for Space Systems".
- 2022 **Seasonal School "ARTIST - 5G/6G NETWORKS TRANSFORMING THE DIGITAL SOCIETY"**, Scuola Superiore Sant'Anna, Pisa.
- 2021 **Splunk 7.x Fundamentals Part 2**, Splunk.
- 2021 **Splunk 7.x Fundamentals Part 1**, Splunk.
- 2019 **CCNA Routing And Switching - Routing And Switching Essentials**, University of L'Aquila, L'Aquila, Italy.
- 2016 **Cisco CCNA Routing And Switching - Introduction To Networks**, University of L'Aquila, L'Aquila, Italy.

Other Professional Experiences

- 2024 **Senior Consultant**, *Consorzio RadioLabs*, Consultancy for the analysis and development of next-generation Tactical Data Links in the avionics field..

Networks and memberships

- 2019 – present **IEEE - Institute of Electrical and Electronics Engineers**.
IEEE Communications Society Membership; IEEE Computer Society Membership; IEEE Aerospace and Electronic Systems; IEEE Signal Processing Society; IEEE Antennas and Propagation Society; IEEE Vehicular Technology Society; IEEE Geoscience and Remote Sensing Society; IEEE Young Professionals; IEEE Women in engineering

I authorize the processing of my personal data contained in my CV pursuant to Legislative Decree 2018/101, and GDPR (European Regulation on Personal Data Protection 2016/679).

Alb Piccin