Bruno De Filippo

PERSONAL DETAILS

Birth	December 30th, 1998
Address	Via Tanari Vecchia 10, 40121 Bologna (BO), Italy
Phone	+39 331 136 49 27
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ORCID	https://orcid.org/0000-0003-0266-1788
Sector	Telecommunications Engineering

EDUCATION

Ph.D. in "Electronics, Telecommunications, and Information Technologies Engineering" `2022 - Present`

Department of Electrical, Electronic, and Information Engineering "Guglielmo Marconi" (DEI), University of Bologna

> *Supervisor*: Prof. Alessandro Vanelli-Coralli
>
> *Topic*: Artificial Intelligence techniques for the Physical Layer in Non-Terrestrial Networks

Visiting Ph.D. student `2025 - Present`

Interdisciplinary Centre for Security, Reliability and Trust (SnT), University of Luxembourg

Qualification for the Engineering Profession `Dec. 2022`

Qualification exam taken at University of Bologna

> *Note: the reported date refers to the publication date of the outcome of the exam*

MSc in Telecommunications Engineering `2020 - 2022`

University of Bologna

> *Final grade*: 110/110 with Honors
>
> *Graduation date*: July 19th, 2022
>
> *Dissertation title*: A novel approach to Non-Orthogonal Random Access with application to NB-IoT NTN systems
>
> *Supervisor*: Prof. Alessandro Vanelli-Coralli
>
> *Co-supervisor*: Dr. Carla Amatetti

BSc in Electronics and Telecommunications Engineering `2017 - 2020`

University of Bologna

> *Final grade*: 110/110 with Honors
>
> *Graduation date*: July 21st, 2020
>
> *Dissertation title*: Random Access procedure in satellite-based NB-IoT systems
>
> *Supervisor*: Prof. Alessandro Vanelli-Coralli
>
> *Co-supervisor*: Dr. Carla Amatetti

WORK EXPERIENCE

Teaching tutor `2024 - Present`

Department of Electrical, Electronic, and Information Engineering "Guglielmo Marconi" (DEI), University of Bologna

    Course: Satellite Communication and Navigation Systems (MSc course)

    Activities: Laboratory activities with MATLAB

Teaching tutor `2023 - Present`

Department of Electrical, Electronic, and Information Engineering "Guglielmo Marconi" (DEI), University of Bologna

    Course: Principles of Telecommunications (BSc course)

    Activities: Laboratory activities with MATLAB

RESEARCH ACTIVITIES

PROJECTS

- 5G-STARDUST (Research Project under the Horizon Europe funding programme)
    - Literature review of Artificial-Intelligence-based techniques for Radio Resource Management in Non-Terrestrial Networks with near-real time RAN Intelligent Controller

- 6G-NTN (Research Project under the Horizon Europe funding programme)
    - Support to project activities

- EAGER (Research Project funded by the European Space Agency)
    - Literature review of Artificial-Intelligence-based techniques for the Physical Layer in Non-Terrestrial Networks
    - Development of a Neural Network for the demodulation of Sparse Code Multiple Access superimposed transmissions in Non-Terrestrial Networks
    - Development of a Neural Network for the prediction of non-geostationary satellite propagation channels

- DYNASAT (Research Project under the Horizon 2020 funding programme)
    - Support to project activities

PUBLICATIONS

CONFERENCE PAPERS:

- B. De Filippo, C. Amatetti, and A. Vanelli-Coralli, *"Channel Prediction in 6G Non-Terrestrial Networks With Deep Learning: a Physical Layer Analysis"*, Accepted for 2025 Joint European Conference on Networks and Communications & 6G Summit (EuCNC/6G Summit), Poznan, Poland, 2025

- B. De Filippo, C. Amatetti, and A. Vanelli-Coralli, *"Channel Prediction in 6G Non-Terrestrial Networks With Deep Learning: a Physical Layer Analysis"*, Accepted for 2025 IEEE International Conference on Machine Learning in Communications and Networking (ICMLCN), Barcelona, Spain, 2025

- B. De Filippo, C. Amatetti, R. Campana, A. Guidotti, and A. Vanelli-Coralli, *"An SCMA Receiver for 6G NTN based on Multi-Task Learning"*, Accepted for 2024 IEEE Global Communications Conference Workshops (GC Wkshps), Cape Town, South Africa, 2024

- B. De Filippo, R. Campana, A. Guidotti, C. Amatetti, and A. Vanelli-Coralli, *"Cell-Free MIMO in 6G NTN with AI-predicted CSI"*, 2024 IEEE 25th International Workshop on Signal Processing Advances in Wireless Communications (SPAWC), Lucca, Italy, 2024, pp. 631-635, doi: 10.1109/SPAWC60668.2024.10694298.

- B. De Filippo, B. Ahmad, D. G. Riviello, A. Guidotti, and A. Vanelli-Coralli, *"Non-Uniform User Distribution in Non-Terrestrial Networks with Application to User Scheduling"*, 2024 IEEE International Mediterranean Conference on Communications and Networking (MeditCom), Madrid, Spain, 2024, pp. 441-446, doi: 10.1109/MeditCom61057.2024.10621409.

- D. G. Riviello, B. De Filippo, B. Ahmad, A. Guidotti, and A. Vanelli-Coralli, *"Location-Based User Scheduling through Graph Coloring for Cell-Free MIMO NTN Systems"*, 2024 Joint European Conference on Networks and Communications & 6G Summit (EuCNC/6G Summit), Antwerp, Belgium, 2024, pp. 652-657, doi: 10.1109/EuCNC/6GSummit60053.2024.10597125.

- B. Ahmad, D. G. Riviello, B. De Filippo, A. Guidotti, and A. Vanelli-Coralli, *"Analysis of Graph-based User Scheduling for Ka-band LEO NTN Systems"*, 28th Ka and Broadband Communications Conference (Ka) and the 40th International Communications Satellite Systems Conference (ICSSC), Bradford, United Kingdom, 2023

UNDER REVIEW:

- B. De Filippo, C. Amatetti, and A. Vanelli-Coralli, *"Faster-Than-Nyquist Equalization With Convolutional Neural Networks"*, 2025

- C. Amatetti, B. De Filippo, and A. Vanelli-Coralli, *"Channel Prediction with Temporal Convolutional Networks: A New Paradigm to Enable Non-orthogonal Multiple Access in 6G NTN"*, 2025

AWARDS, SCHOLARSHIPS, AND MEMBERSHIPS

BEST PAPER AWARDS:

- B. Ahmad, D. G. Riviello, B. De Filippo, A. Guidotti, and A. Vanelli-Coralli, *"Analysis of Graph-based User Scheduling for Ka-band LEO NTN Systems"*, 28th Ka and Broadband Communications Conference (Ka) and the 40th International Communications Satellite Systems Conference (ICSSC), Bradford, United Kingdom, 2023

AWARDS:

- GRADUATION AWARD FOR A.Y. 2021/22 GRADUATES OF THE UNIVERSITY OF BOLOGNA (2023)
  The University of Bologna offered public recognition to 10 male and 10 female graduates of the A.Y. 2021/2022 for each subject area who have accomplished significant achievements in their studies while at the same time committing themselves to activities benefiting the community

- STUDY AWARD FOR DESERVING STUDENTS ENROLLED IN THE A.Y. 2021/22 IN DEGREE PROGRAMMES AT THE UNIVERSITY OF BOLOGNA (2022)
  The position in the official ranking was 1st among the students enrolled in a degree programme of the School of Engineering and Architecture of the University of Bologna in the A.Y. 2021/22

TRAVEL GRANTS:

- COMSOC STUDENT TRAVEL GRANT, IEEE MEDITCOM 2024 (2024)

SCOLARSHIPS:

- TOTAL MERIT-BASED EXEMPTION FOR STUDENTS ENROLLED IN THE FIRST YEAR OF SECOND CYCLE DEGREE PROGRAMMES (2020)

MEMBERSHIPS:

- IEEE GRADUATE STUDENT MEMBER - N. 98796930 (2022 - Present)

- IEEE COMMUNICATIONS SOCIETY GRADUATE STUDENT MEMBER (2022 - Present)

- IEEE SIGNAL PROCESSING SOCIETY GRADUATE STUDENT MEMBER (2024 - Present)

SCIENTIFIC ENGAGEMENTS

TECHNICAL PROGRAM COMMITTEE (TPC):

- 12th Advanced Satellite Multimedia Systems Conference (ASMS), 26-28 February, 2025, Sitges (Spain)
  TPC member

- IEEE International Symposium on Personal, Indoor and Mobile Radio Communications (PIMRC), 2-5 September, 2024, Valencia (Spain)
  TPC member for "6G-NTN: Architectures and Technologies" workshop

CONFERENCES:

- 2024 IEEE Global Communications Conference (Globecom), 8-12 December, 2024, Cape Town (South Africa)
  Paper presentation

- 2024 IEEE International Workshop on Signal Processing Advances in Wireless Communications (SPAWC), 10-13 September, 2024, Lucca (Italy)
  Paper presentation

- 2024 IEEE International Mediterranean Conference on Communications and Networking (MeditCom), 8-11 July, 2024, Madrid (Spain)
  Paper presentation

- European Conference on Networks and Communications (EuCNC), 3-6 June, 2024, Antwerp (Belgium)
  Paper presentation

- AI for Good Global Summit, 29-31 May, 2024, Geneva (Switzerland)
  Participation to workshop

- ETSI 6G-NTN Conference, 3-4 April, 2024, Sophia Antipolis (France)
  Participation to conference

- 2023 IEEE International Conference on Wireless for Space and Extreme Environments (WiSEE 2023), 6-8 September, 2023, Aveiro (Portugal)
  Tutorial on "AI for Non-Terrestrial Networks"

- 21st Mediterranean Communication and Computer Networking Conference (MedComNet 2023), 13-15 June, 2023, Ponza Island (Italy)
  Oral presentation on "NTN for B5G: the ESA EAGER vision"

- 11th Advanced Satellite Multimedia Systems Conference (ASMS 2022), 6-8 September, 2022, Graz (Austria)
  Participation to conference

PUBLIC EVENTS:

- Marconi Day 2024, 25 April, 2024, Sasso Marconi (Italy)
  Scientific poster and presentation with 3 Minute Thesis format titled "Reaching Massive Global Connectivity with Satellites and AI"

PHD SCHOOLS:

- INTERACT 5th Training School: AI/ML for 6G Communication Networks (and Beyond), 1-4 July, 2024, Castelldefels (Spain)
  Scientific poster presentation

- Frontier Technologies for Space 2.0 Communications, 29 August - 1 September, 2023, Online

- Satellite Network of Experts (SatNEx) School 2022, 4-6 September, 2022, Graz (Austria)

- Complex Network and Telecommunications (CNTC 2021), 5-9 July, 2021, Como (Italy)

CERTIFICATIONS

English Proficiency - IELTS Academic   April 2022
Score: 8.0/9.0
Corresponding CEFR level: C1

SKILLS

Languages	Italian (mother tongue) English (CEFR C1)
Programming Languages	MATLAB, PYTHON, JAVA, C, C++
Software	SIMULINK, CST STUDIO SUITE, MICROSOFT 365 SUITE