BASSOLI RICCARDO, Jun.-Prof. Dr.-Ing.

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PROFESSIONAL EXPERIENCE

May 2022 - Present	**Technische Universität Dresden, Deutsche Telekom Chair of Communication Networks,** Dresden, Germany *Qualification: Juniorprofessur, head of the Quantum Communication Networks research group* • Quantum communication networks. • Design of quantum technologies for future 6G networks.
August 2019 – April 2022	**Technische Universität Dresden, Deutsche Telekom Chair of Communication Networks,** Dresden, Germany *Qualification: Senior researcher* • Quantum communication networks. • Mobile Edge Computing (MEC) in the space. • Multi-agent and micro-service based 6G networks.
August 2016 – July 2019	**University of Trento,** Trento, Italy *Qualification: Postdoctoral researcher* • Stochastic geometry, mathematical modelling of 5G cellular networks • Network Function Virtualisation (NFV), Software-Defined Networking (SDN) and Cloud Radio Access Network (C-RAN) • Networks of UAVs for border monitoring • Autonomic networks
April 2016 – July 2016	**University of Trento,** Trento, Italy *Qualification: researcher*
2011 – 2015	**FP7 Marie Curie ITN (Initial Training Network) GREENET project** at **Instituto de Telecomunicações**, Aveiro, Portugal *Qualification: Early Stage Researcher* • Design of energy efficient vertical handover schemes • Design of secure vertical handover schemes
April – September 2013	**AIRBUS Defence and Space**, Elancourt, France

	Qualification: Visiting Researcher • Fully Homomorphic Encryption Schemes, Cryptography • Advanced authentication methods for heterogeneous cellular networks

EDUCATION

November 2016	**Institute for communication systems (ICS) – 5G Innovation centre**, University of Surrey, Guildford, UK
	
	Ph.D. in Electronic Engineering
	
	• Design of energy efficient network coding schemes for IEEE 802.21 Media Independent Handover (MIH) services
	  ○ 5G and heterogeneous wireless networks
	  ○ Coding theory, information theory, Network Error-correcting codes, modern coding schemes

November 2010	**University of Modena and Reggio Emilia** *M.Sc. in Telecommunications engineering* • Master thesis: collaboration with the European Space Agency (ESA) consisting in the study of error-correcting codes for satellite-based Automatic Identification System (AIS)
February 2008	**University of Modena and Reggio Emilia** *B.Sc. in Telecommunications engineering*

PROJECTS

2023 – ongoing EU flagship "Hexa-X II" https://hexa-x-ii.eu/

2023 – ongoing BMBF "Resilience for the Quantum Internet" https://www.forschung-it-sicherheit-kommunikationssysteme.de/projekte/q-trex

Role: Principal investigator and member of coordination team

2022 – ongoing EU "Quantum Internet Alliance" https://quantum-internet.team

2022 – ongoing BMBF "6G-Quantum Security" (6G-QuaS) https://www.forschung-it-sicherheit-kommunikationssysteme.de/projekte/6g-quas

2022 – ongoing BMBF "Quantum Internet of Things" (QUIET) https://www.forschung-it-sicherheit-kommunikationssysteme.de/projekte/quiet

Role: Principal Investigator

2022 – ongoing BMBF "Quantum Wireless Campus Network" (QD-CamNetz) https://www.forschung-it-sicherheit-kommunikationssysteme.de/projekte/qd-camnetz

Role: Principal investigator and member of coordination team

2022 – ongoing BMBF "Quantum Physical Layer Service Integration" (QuaPhySI) https://www.forschung-it-sicherheit-kommunikationssysteme.de/projekte/quaphysi

Role: Principal Investigator

2021 – ongoing EU flagship "Hexa-X" https://hexa-x.eu/

2020 – ongoing BMBF "6G-life" https://6g-life.de

Role: Principal Investigator

2018–2021 NATO Science for Peace and Security (SPS) Programme, in the framework of the project SPS G5428 "Dynamic Architecture based on UAVs Monitoring for Border Security and Safety" (DAVOSS) https://www.granelli-lab.org/researches/relevant-projects/davoss

Role: Work Package Leader.

TUTORIALS

IEEE International Conference on Communications (ICC), June 2021: TUT-22 "Entanglement-assisted (Quantum) Communication Networks", https://icc2021.ieee-icc.org/program/tutorials

Supervision of Researchers in Early Career Phases

Ph.D. researchers

2023 – ongoing Akhmadjon Rajabov, Technische Universität Dresden, Germany

2023 – ongoing Leonardo Alexis Gonzalez Zuniga, Technische Universität Dresden, Germany

2023 – ongoing Siddharth Das, Technische Universität Dresden, Germany

2022 – ongoing Swaraj Shekhar Nande, Technische Universität Dresden, Germany

2022 – ongoing Sonai Biswas, Technische Universität Dresden, Germany

2022 – ongoing Shivam Maheshwari, Technische Universität Dresden, Germany

2022 – ongoing Nikhitha Nunavath, Technische Universität Dresden, Germany

2022 – ongoing Marius Paul, Technische Universität Dresden, Germany.

M.Sc. Theses

2021 Siddharth Das, Technische Universität Dresden, Germany

2021 Leonardo Alexis Gonzalez Zuniga, Technische Universität Dresden, Germany

Organisation of Conferences

IEEE Globecom 2022 – December 2022, Rio de Janeiro (Brazil)

Role: Workshop Organiser

European Wireless 2022 – September 2022, Dresden (Germany)

Role: Program and Special Session Chair

IEEE MELECON 2022 – June 2022, Palermo (Italy)

Role: Track Organiser and Chair

European Wireless 2021 – November 2021, Verona (Italy)

Role: Technical Program Chair

IEEE CAMAD 2019 – September 2019, Limassol (Cyprus)

Role: Workshop Co-chair

IEEE NFV-SDN 2018 – November 2018, Verona (Italy)

Role: Local Chair

BROADNETS 2018 – September 2018, Faro (Portugal)

Role: Publicity and Social Media Chair

IEEE 5G Summit – March 2018, Trento (Italy)

Role: Organising Committee Member.

AWARDS

2015 – "Business Enterprise Student Support Scheme (BESSS)" at University of Surrey.

LANGUAGES

Italian (native), English (fluent), Portuguese (fluent), Brazilian Portuguese (fluent).

LIST OF PUBLICATIONS

Books

- R. Bassoli, H. Boche, C. Deppe, R. Ferrara, F. H.P. Fitzek, J. Gisbert, S. Saeedinaeen, "Quantum Communication Networks", 1st Ed., Springer, Jan. 2021, ISBN: 978-3-030-62938-0.

Journal publications

- C. Marcolla, V. Sucasas, M. Manzano, R. Bassoli, F. H. P. Fitzek and N. Aaraj, "Survey on Fully Homomorphic Encryption, Theory, and Applications," *Proceedings of the IEEE*, vol. 110, no. 10, pp. 1572-1609, Oct. 2022.
- J. He, H. Wu, X. Xiao, R. Bassoli, F. H. P. Fitzek, "Functional Split of In-Network Deep Learning for 6G: A Feasibility Study," *IEEE Wireless Communications*, vol. 29, no. 5, pp. 36-42, Oct. 2022.
- F. Granelli, R. Bassoli, J. Nötzel, F. H. P. Fitzek, H. Boche, and N. L. S. Fonseca, "A novel architecture for future classical-quantum communication networks", *Hindawi Wireless Communications and Mobile Computing*, vol. 2022, ID 3770994, pp. 1–18, Apr. 2022.
- S. Bonafini, C. Sacchi, R. Bassoli, K. Kondepu, F. Granelli, F. H.P. Fitzek, "End-to-end performance assessment of a 3D network for 6G connectivity on Mars surface", *Elsevier Computer Networks*, 2022, ISSN: 1389-1286.
- S. Bonafini, C. Sacchi, R. Bassoli, F. Granelli, K. Kondepu and F. H. P. Fitzek, "An Analytical Study on Functional Split in Martian 3D Networks," *IEEE Transactions on Aerospace and Electronic Systems*, 2022.
- S. DiAdamo, J. Nötzel, S. Sekavčnik, R. Bassoli, R. Ferrara, C. Deppe, F. H. P. Fitzek, and H. Boche, "Integrating quantum simulation for quantum-enhanced classical network emulation", *IEEE Communications Letters*, vol. 25, no. 12, pp. 3922–3926, Dec. 2021.
- R. Ferrara, R. Bassoli, C. Deppe, F. H.P. Fitzek, H. Boche, "The Computational and Latency Advantage of Quantum Communication Networks", *IEEE Communications Magazine*, Jun. 2021.
- J. Rodriguez, G. P. Koudouridis, X. Gelabert, M. Tayyab, R. Bassoli, F. Fitzek, R. Torre, R. Abd-Alhameed, M. Sahedin, I Elfergani, S. Irum, G. Schulte, P. Diogo, F. Marzouk, M. de Ree, G. Mantas, I. Politis, "Secure Virtual Mobile Small Cells: A Stepping Stone Towards 6G", *IEEE Communications Standards Magazine*, pp. 1-15, Apr. 2021.
- S. T. Arzo, C. Naiga, F. Granelli, R. Bassoli, M. Devetsikiotis and F. H. P. Fitzek, "A Theoretical Discussion and Survey of Network Automation for IoT: Challenges and Opportunity," *IEEE Internet of Things Journal*, Apr. 2021.
- S. T. Arzo, R. Bassoli, F. Granelli and F. H. P. Fitzek, "Multi-Agent Based Autonomic Network Management Architecture", *IEEE Transactions on Network and Service Management*, Early Access, Feb. 2021.
- F. Granelli, C. Costa, J. Zhang, R. Bassoli, F. H. P. Fitzek, "Design of an On-Demand Agile 5G Multi-Access Edge Computing Platform Using Aerial Vehicles", *IEEE Communications Standards Magazine*, vol. 4, no. 4, pp. 34-41, December 2020.
- S. T. Arzo, R. Bassoli, F. Granelli, F. H. P. Fitzek, "Study of Virtual Network Function Placement in 5G Cloud Radio Access Network", *IEEE Transactions on Network and Service Management*, vol. 17, no. 4, pp. 2242-2259, Dec. 2020.
- R. Bassoli, F. Granelli, C. Sacchi, S. Bonafini, F. H. P. Fitzek, "CubeSat-Based 5G Cloud Radio Access Networks: A Novel Paradigm for On-Demand Anytime/Anywhere Connectivity", *IEEE Vehicular Technology Magazine*, vol. 15, no. 2, pp. 39-47, June 2020.

- R. Bassoli, F. Granelli, S. T. Arzo, M. Di Renzo, "Toward 5G cloud radio access network: An energy and latency perspective", *Transactions on Emerging Telecommunications Technologies (ETT) (Wiley)*, 32:e3669, pp. 1-16, Jun. 2019.
- G. Baggio, R. Bassoli, F. Granelli, "Cognitive Software-Defined Networking Using Fuzzy Cognitive Maps", *IEEE Transactions on Cognitive Communications and Networking*, vol. 5, no. 3, pp. 517-539, Sept. 2019.
- F. Granelli, R. Bassoli, "Autonomic Mobile Virtual Network Operators for Future Generation Networks", *IEEE Network*, vol. 32, no. 5, Sep./Oct. 2018.
- A. A. Gebremariam, M. Usman, R. Bassoli, F. Granelli, "SoftPSN: Software-Defined Resource Slicing for Low-Latency Reliable Public Safety Networks", *Wireless Communications and Mobile Computing (Hindawi)*, 2018.
- R. Bassoli, H. Marques, J. Rodriguez, C. Gruet and R. Tafazolli, "Enhanced Authentication for WLAN-EPS Interworking Systems", *IET Electronics letters*, Sep. 2015.
- V. N. Talooki, R. Bassoli, D. E. Lucani, J. Rodriguez, F. H.P. Fitzek, H. Marques and R. Tafazolli, "Security concerns and countermeasures in network coding based communication systems: A survey", *Computer Networks (Elsevier)*, Mar. 2015.
- R. Bassoli, H. Marques, J. Rodriguez, K. W. Shum and R. Tafazolli, "Network Coding Theory: A Survey", *IEEE Communications Surveys and Tutorials*, Feb. 2013.

Book chapters

- G. Segala, R. Bassoli, F. Granelli, F. H.P. Fitzek, "Connected Unmanned Aerial Vehicles for Flexible Coverage, Data Gathering and Emergency Scenarios", in *Connected and Autonomous Vehicles in Smart Cities*, CRC Press, 2020.
- R. Bassoli, "Network Function Virtualization", in *Computing in Communication Networks – From Theory to Practice*, Elsevier, 2020.
- F. Granelli, P. Seeling, F. H.P. Fitzek, R. Bassoli, "Standardization Activities for Future Communication Networks", in *Computing in Communication Networks – From Theory to Practice*, Elsevier, 2020.
- F. Granelli, C. Costa, R. Bassoli, "Multiple Access Control Strategies for Nanoscale Communications and Networking", in *Nanoscale Networking and Communications Handbook*, CRC Press, 2019.
- R. Bassoli, H. Marques, J. Rodriguez and R. Tafazolli, "Network Coding for Wireless Networking", in *Green Communications for 4G Wireless Systems*, River publishers, 2013.
- A. Lykourgiotis, R. Bassoli, H. Marques and J. Rodriguez, "IP-Based Mobility scheme supporting 3D video streaming services", in *3D Future Internet Media*, Springer, 2013.

Conference publications

- M. Paul, J. A. Cabrera, R. Bassoli, M. V. Pedersen, and F. H. P. Fitzek, "Spooky RLNC at a distance: Exploiting quantum entanglement to convey coding coefficients", *IEEE Globecom Workshops*, Dec. 2022.
- B. M. Khorsandi et al., "6G E2E Architecture Framework with Sustainability and Security Considerations," *IEEE Globecom Workshops (GC Wkshps)*, Rio de Janeiro, Brazil, 2022, pp. 1-6.
- H. Wu, M. Tömösközi, R. Bassoli, J. Zhang, F. H.P. Fitzek, "Experimental Proof of the Energy Advantage of In-Network Intelligence", *International Conference on Electrical, Computer, Communications and Mechatronics Engineering (ICECCME)*, Male, Maldives, 2022.
- V. Gudepu et al., "Edge Computing in Micro Data Centers for Firefighting in Residential Areas of Future Smart Cities," *International Conference on Electrical, Computer, Communications and Mechatronics Engineering (ICECCME)*, Maldives, Maldives, 2022, pp. 1-6.

- M. Ericson et al., "Setting 6G Architecture in Motion – the Hexa-X approach," *Joint European Conference on Networks and Communications & 6G Summit (EuCNC/6G Summit)*, Grenoble, France, 2022, pp. 451-456.
- J. Zhang, H. Wu, S. Shen, R. Bassoli, G. T. Nguyen and F. H. P. Fitzek, "Evaluation of an Intelligent Task Scheduling Algorithm for 6G 3D Networking," *IEEE 21st Mediterranean Electrotechnical Conference (MELECON)*, Palermo, Italy, 2022, pp. 1211-1216.
- P. Hofmann, R. Bassoli, F. H. P. Fitzek and M. Reisslein, "MC NFV: Molecular Communication NFV in 6G Networks," *IEEE 21st Mediterranean Electrotechnical Conference (MELECON)*, Palermo, Italy, 2022, pp. 1205-1210.
- J. Zhang, H. Wu, R. Bassoli, R. Bonetto and F. H. P. Fitzek, "Deep Learning-based Energy Optimization for Electric Vehicles Integrated Smart Micro Grid," *ICC 2022 - IEEE International Conference on Communications*, Seoul, Korea, Republic of, 2022, pp. 2187-2193.
- S. Bonafini, C. Sacchi, F. Granelli, R. Bassoli, F. H. P. Fitzek and K. Kondepu, "3D Cloud-RAN Functional Split to Provide 6G Connectivity on Mars," *2022 IEEE Aerospace Conference (AERO)*, Big Sky, MT, USA, 2022, pp. 1-13.
- S. T. Arzo, F. Zambotto, F. Granelli, R. Bassoli, F. H.P. Fitzek, "A Translator as Virtual Network Function for Network Level Interoperability of Different IoT Technologies", *2021 2nd International Workshop on Network Softwarization Techniques for IoT Applications* (SoftIoT 2021), Apr. 2021.
- S. Bonafini, R. Bassoli, F. Granelli, F. H. P. Fitzek, C. Sacchi, "Virtual Baseband Unit Splitting Exploiting Small Satellite Platforms," *IEEE Aerospace Conference 2020*, Mar. 2020.
- R. Bassoli, F. Granelli, "Pico Satellites for Cloud Radio Access Network," *2019 IEEE 2nd 5G World Forum (5GWF)*, 2019.
- R. Bassoli, F. Granelli, "An Algebraic Approach to Network Slicing," *European Wireless 2019; 25th European Wireless Conference*, May 2019.
- R. Bassoli, C. Sacchi, F. Granelli, I. Ashkenazi, "A Virtualized Border Control System based on UAVs: Design and Energy Efficiency Considerations", *IEEE Aerospace Conference 2019*, Mar. 2019.
- F. Granelli, R. Bassoli, "Towards Autonomic Mobile Network Operators", *IEEE CloudNet 2018*, Oct. 2018.
- F. Granelli, R. Bassoli, M. Di Renzo, "Energy-Efficiency Analysis of Cloud Radio Access Network in Heterogeneous 5G Networks", *European Wireless 2018; 24th European Wireless Conference*, May 2018.
- R. Bassoli, M. Di Renzo, F. Granelli, "Analytical Energy-Efficient Planning of 5G Cloud Radio Access Network", *IEEE International Conference on Communications* (ICC 2017), Paris (France), May 2017.
- R. Bassoli, V. N. Talooki, H. Marques, J. Rodriguez, R. Tafazolli and S. Mumtaz, "Hybrid Serial Concatenated Network Codes for Burst Erasure Channels", *81st Vehicular Technology Conference 2015* (VTC 2015), May 2015.
- R. Bassoli, V. N. Talooki, H. Marques, J. Rodriguez and R. Tafazolli, "Product Network Codes for Reliable Communications in Diamond Networks", *8th International Wireless Internet Conference 2014* (WiCON 2014), Nov. 2014.
- R. Bassoli, V. N. Talooki, H. Marques, J. Rodriguez, S. Vahid, and R. Tafazolli, "LT codes for video streaming in burst erasure channels: an energy analysis", *19th IEEE Symposium on Computers and Communications* (ISCC 2014), Jun. 2014.
- R. Bassoli, H. Marques, A. Radwan, J. Rodriguez, S. Vahid and R. Tafazolli, "Energy Analysis of Network Coding in Hard Vertical Handovers", *3rd International Conference on Communications and Information Technology* (ICCIT 2013), Jun. 2013.

- R. Bassoli, H. Marques, J. Rodriguez, S. Vahid and R. Tafazolli, "Network Coding for Vertical Handoffs between LTE and IEEE 802.11n: An Energy Perspective", *European Wireless 2013; 19th European Wireless Conference 2013*, Apr. 2013.
- R. Bassoli, V. N. Talooki, H. Marques, J. Rodriguez, and R. Tafazolli, "Energy Efficient Discovery of Neighbouring Nodes via Random Linear Network Coding", *18th IEEE International Workshop on Computer-Aided Modeling Analysis and Design of Communication Links and Networks 2013* (CAMAD 2013), Sept. 2013.

Data Firma

10.02.2023