Francesco Restuccia

Assistant Professor
Department of Electrical and Computer Engineering
Associate Faculty, Roux Institute
Associate Faculty, Institute for the Wireless Internet of Things
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RESEARCH FOCUS AND TECHNICAL EXPERTISE

Design and evaluation of next-generation wireless systems, with applications to the Internet of Things (IoT) and 5G-and-beyond networks. Technical expertise includes (i) machine learning algorithms and frameworks; (ii) wireless communication standards and architectures; (iii) FPGA-level embedded systems design and driver programming; (iv) software-defined radio development; (v) linear and non-linear optimization.

HIGHLIGHTS OF TRACK RECORD

9 papers in IEEE INFOCOM, 7 in ACM MobiHoc, 1 in ACM SenSys, 1 in IEEE PerCom, 10 in IEEE/ACM Transactions, 2 book chapters, 1 granted US patent, 14 pending US patent applications, ACM SIGMOBILE Research Highlights 2020, IEEE Senior Member, 2 NSF projects (one as lead PI).

EDUCATION

Doctor of Philosophy (Ph.D.) in Computer Science

MISSOURI UNIVERSITY OF SCIENCE AND TECHNOLOGY, Rolla, MO, United States
August 2012 - December 2016
Advisor: **Prof. Sajal K. Das**, Daniel St. Clair Endowed Chair of Computer Science
Thesis: *"Mechanisms for Improving Information Quality in Smartphone Crowdsensing Systems"*

Master of Science (M.S.) in Computer Engineering

UNIVERSITY OF PISA, Pisa, Italy
Concentration: Networking and Multimedia
October 2009 - October 2011
Level of Distinction: *Summa Cum Laude*
Top GPA (29.95/30) among graduates, attended *Percorso di Eccellenza* (excellence curriculum)

Bachelor of Science (B.S.) in Computer Engineering

UNIVERSITY OF PISA, Pisa, Italy
October 2006 - July 2009
Level of Distinction: *Summa Cum Laude*
Top 5% GPA (28.2/30) among undergraduates

PUBLICATIONS

BOOK CHAPTERS

- **F. Restuccia**, S. D'Oro, L. Zhang, and T. Melodia, "The Role of Machine Learning and Radio Reconfigurability in the Quest for Wireless Security", in *Proactive and Dynamic Network Defense*, pp. 191-221, Springer, May 2019, ISBN: 9783030105976. DOI: 10.1007/978-3-030-10597-6_8.
- J. Jagannath, N. Polosky, A. Jagannath, **F. Restuccia** and T. Melodia, "Neural Networks for Signal Intelligence: Theory and Practice, " in *Machine Learning for Future Wireless*

Communications, John Wiley and IEEE, November 2019, ISBN: 9781119562252. DOI: 10.1002/9781119562306.ch13.

JOURNAL PAPERS

- M. Polese, V. Ariyarathna, P. Sen, J. V. Siles, **F. Restuccia**, T. Melodia, J. M. Jornet, "Dynamic Spectrum Sharing Between Active and Passive Users Above 100 GHz," accepted for publication in **Nature Communications Engineering**, 2022.
- **F. Restuccia**, S. D'Oro, A. Al-Shawabka, B. Costa Rendon, S. Ioannidis and T. Melodia, "DeepFIR: Channel-Robust Physical-Layer Deep Learning Through Adaptive Waveform Filtering," **IEEE Transactions on Wireless Communications**, Vol. 20, Is. 12, pp. 8054 – 8066, December 2021. DOI: 10.1109/TWC.2021.3089878.
- S. D'Oro, L. Bonati, **F. Restuccia**, and T. Melodia, "Coordinated 5G Network Slicing: How Constructive Interference Can Boost Network Throughput," **IEEE/ACM Transactions on Networking**, Vol. 29, Is 4, pp. 1881–1894, Aug. 2021. DOI: 10.1109/TNET.2021.3073272.
- R. Guida, N. Dave, **F. Restuccia**, E. Demirors, and T. Melodia, "The Implantable Internet of Medical Things: Toward Lifelong Remote Monitoring and Treatment of Chronic Diseases," **ACM GetMobile**, Vol. 24, No. 3, Sept. 2020. DOI: 10.1145/3447853.3447861.
- **F. Restuccia**, and T. Melodia, "Deep Learning at the Physical Layer: System Challenges and Applications to 5G and Beyond," *IEEE Communications Magazine* (**IEEE ComMag**), Vol. 58, Is. 10, October 2020. DOI: 10.1109/MCOM.001.2000243.
- L. Bertizzolo, L. Bonati, E. Demirors, A. Al-Shawabka, S. D'Oro, **F. Restuccia**, and T. Melodia, "Arena: A 64-antenna SDR-based Ceiling Grid Testing Platform for Sub-6 GHz 5G-and-Beyond Radio Spectrum Research," Elsevier Computer Networks (**COMNET**), Volume 181, November 2020. DOI: 10.1016/J.COMNET.2020.107436.
- S. D'Oro, **F. Restuccia**, and T. Melodia, "Toward Operator-to-Waveform 5G Radio Access Network Slicing," *IEEE Communications Magazine* (**IEEE ComMag**), Vol. 58, No. 4, pp.18-23, April 2020. DOI: 10.1109/MCOM.001.1900316.
- K. Sankhe, M. Belgiovine, F. Zhou, L. Angioloni, **F. Restuccia**, S. D'Oro, T. Melodia, S. Ioannidis, and K. Chowdhury, "No Radio Left Behind: Radio Fingerprinting Through Deep Learning of Physical-Layer Hardware Impairments," *IEEE Transactions on Cognitive Communications and Networking* (**IEEE TCCN**), Special Issue on Evolution of Cognitive Radio to AI-enabled Radio and Networks, Vol. 6, Is. 1, March 2020. DOI: 10.1109/TCCN.2019.2949308.
- J. Jagannath, N. Polosky, A. Jagannath, **F. Restuccia**, and T. Melodia, "Machine Learning for Wireless Communications in the Internet of Things: A Comprehensive Survey," *Ad Hoc Networks* (**ADHOC**), Volume 93, pp. 101913, October 2019. DOI: 10.1016/J.ADHOC.2019.101913.
- L. Zhang, **F. Restuccia**, T. Melodia, and S. Pudlewski, "Taming Cross-Layer Attacks in Wireless Networks: A Bayesian Learning Approach," *IEEE Transactions on Mobile Computing* (**IEEE TMC**), Vol. 18, No. 7, pp. 1688-1702, July 2019. DOI: 10.1109/TMC.2018.2864155.
- S. D'Oro, **F. Restuccia**, T. Melodia, and S. Palazzo, "Low-Complexity Distributed 5G Network Slicing: Analysis, Algorithms, and Experimental Results," *IEEE/ACM Transactions on Networking* (**IEEE/ACM TNET**), Vol. 26, No. 6, pp. 2815-2828, December 2018. DOI: 10.1109/TNET.2018.2878965.
- **F. Restuccia**, S. D'Oro, and T. Melodia, "Securing the Internet of Things in the Age of Machine Learning and Software-defined Networking," *IEEE Internet of Things Journal* (**IEEE IoT-J**), Vol. 5, Is. 6, pp. 4829-4842, December 2018. DOI: 10.1109/JIOT.2018.2846040.

- **F. Restuccia**, P. Ferraro, S. Silvestri, T.S. Sanders, S. K. Das, and G. Lo Re, "FIRST: A Framework for Optimizing Information Reliability in Smartphone Crowdsensing," *ACM Transactions on Sensor Networks* (**ACM TOSN**), Vol. 15, Is. 1, February 2019. DOI: 10.1145/3267105.
- **F. Restuccia**, P. Ferraro, S. Silvestri, S. K. Das, and G. Lo Re, "IncentMe: Effective Mechanism Design to Stimulate Crowdsensing Participants with Uncertain Mobility," *IEEE Transactions on Mobile Computing* (**IEEE TMC**), Vol. 18, No. 7, pp. 1571-1584, July 2019. DOI: 10.1109/TMC.2018.2863288.
- **F. Restuccia**, N. Ghosh, S. Bhattacharjee, S.K. Das, and T. Melodia, "Quality of Information in Mobile Crowdsensing: Survey and Research Challenges," *ACM Transactions on Sensor Networks* (**ACM TOSN**), Vol. 13, Is. 4, No. 34, December 2017. DOI: 10.1145/3139256.
- **F. Restuccia**, S.K. Das, and J. Payton, "Incentive Mechanisms in Participatory Sensing: Survey and Research Challenges", *ACM Transactions on Sensor Networks* (**ACM TOSN**), Vol. 12, Is. 2, No. 13, February 2016. DOI: 10.1145/2888398.
- **F. Restuccia** and S. K. Das, "Optimizing the Lifetime with QoS of Sensor Networks with Uncontrollable Mobile Sinks", *ACM Transactions on Sensor Networks* (**ACM TOSN**), Vol. 12, Is. 1, No. 2, March 2016. DOI: 10.1145/2873059.
- D. De Guglielmo, **F. Restuccia**, G. Anastasi, M. Conti, and S.K. Das, "Accurate and Efficient Modeling of 802.15.4 Unslotted CSMA/CA through Event Chains Computation", *IEEE Transactions on Mobile Computing* (**IEEE TMC**), Vol. 15, No. 12, pp. 2954-2968, December 2016. DOI: 10.1109/TMC.2016.2528248.
- **F. Restuccia**, G. Anastasi, M. Conti, S. K. Das, "Analysis and Optimization of Protocol for Mobile Element Discovery in Sensor Networks", *IEEE Transactions on Mobile Computing* (**IEEE TMC**), Vol. 13, No. 9, pp. 1942-1954, September 2014. DOI: 10.1109/TMC.2013.88.

CONFERENCE PAPERS

- 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, T. Melodia, "Colosseum: Large-Scale Wireless Experimentation Through Hardware-in-the-Loop Network Emulation," *Proc. of IEEE Intl. Symp. on Dynamic Spectrum Access Networks* (**IEEE DySPAN**), Virtual Conference, December 2021. DOI: 10.1109/DySPAN53946.2021.9677430.
- D. Uvaydov, R. Guida, P. Johari, **F. Restuccia** and T. Melodia, "AiEEG: Personalized Seizure Prediction Through Partially-Reconfigurable Deep Neural Networks," Proc. of IEEE International Conference on Pervasive Computing and Communications (**IEEE PerCom**), Pisa, Italy, March 2022, Full Paper (*Acceptance Rate of Full Papers: 10%*).
- L. Baldesi, **F. Restuccia** and T. Melodia, "ChARM: NextG Spectrum Sharing Through Data-Driven Real-Time O-RAN Dynamic Control," *Proc. of IEEE Conference on Computer Communications* (**IEEE INFOCOM**), 2022.
- M. Piva, G. Maselli, and **F. Restuccia**, "The Tags Are Alright: Robust Large-Scale RFID Clone Detection Through Federated Data-Augmented Radio Fingerprinting," *Proc. of ACM International Symposium on Theory, Algorithmic Foundations, and Protocol Design for Mobile Networks and Mobile Computing* (**ACM MobiHoc**), Shanghai, China, July 2021. DOI: 10.1145/3466772.3467033.
- M. Polese, **F. Restuccia**, and T. Melodia, "DeepBeam: Deep Waveform Learning for Coordination-Free Beam Management in mmWave Networks," *Proc. of ACM International Symposium on Theory, Algorithmic Foundations, and Protocol Design for Mobile Networks and Mobile Computing* (**ACM MobiHoc**), Shanghai, China, July 2021. DOI: 10.1145/3466772.3467035.

- A. Al-Shawabka, P. Pietraski, S.B. Pattar, **F. Restuccia** and T. Melodia, "DeepLoRa: Fingerprinting LoRa Devices at Scale Through Deep Learning and Data Augmentation," *Proc. of ACM International Symposium on Theory, Algorithmic Foundations, and Protocol Design for Mobile Networks and Mobile Computing* (**ACM MobiHoc**), Shanghai, China, July 2021. DOI: 10.1145/3466772.3467054.
- L. Ghiro, **F. Restuccia**, S. D'Oro, S. Basagni, T. Melodia, L. Maccari, and R. Lo Cigno," A Blockchain Definition to Clarify Its Role for the Internet of Things," *Mediterranean Communication and Computer Networking Conference* (**MedComNet**), 2021. DOI: 10.1109/MedComNet52149.2021.9501280.
- D. Callegaro, M. Levorato, and **F. Restuccia**, "SeReMAS: Self-Resilient Mobile Autonomous Systems Through Predictive Edge Computing," *Proc. of IEEE International Conference on Sensing, Communication and Networking* (**IEEE SECON**), Virtual Conference, July 2021. DOI: 10.1109/SECON52354.2021.9491618.
- D. Uvaydov, S. D'Oro, **F. Restuccia** and T. Melodia, "DeepSense: Fast Wideband Spectrum Sensing Through Real-Time In-the-Loop Deep Learning," *Proc. of IEEE Conference on Computer Communications* (**IEEE INFOCOM**), Virtual Conference, May 2021. DOI: 10.1109/INFOCOM42981.2021.9488764.
- L. Bonati, S. D'Oro, **F. Restuccia**, S. Basagni and T. Melodia, "SteaLTE: Private 5G Cellular Connectivity as a Service with Full-stack Wireless Steganography, " *Proc. of IEEE Conference on Computer Communications* (**IEEE INFOCOM**), Virtual Conference, May 2021. DOI: 10.1109/INFOCOM42981.2021.9488889.
- S. D'Oro, **F. Restuccia** and T. Melodia, "Can You Fix My Neural Network? Real-Time Adaptive Waveform Synthesis for Resilient Wireless Signal Classification", *Proc. of IEEE Conference on Computer Communications* (**IEEE INFOCOM**), Virtual Conference, May 2021. DOI: 10.1109/INFOCOM42981.2021.9488865.
- **F. Restuccia**, S. D'Oro, A. Al-Shawabka, B. Costa Rendon, K. Chowdhury, S. Ioannidis and T. Melodia "Generalized Wireless Adversarial Deep Learning," Proc. of ACM Workshop on Wireless Security and Machine Learning (**ACM WiseML**, co-located with **ACM WiSec**), pp. 49-54, 2020. DOI: 10.1145/3395352.3402625.
- **F. Restuccia**, and T. Melodia, "PolymoRF: Polymorphic Wireless Receivers Through Physical Layer Deep Learning," *Proc. of ACM International Symposium on Theory, Algorithmic Foundations, and Protocol Design for Mobile Networks and Mobile Computing* (**ACM MobiHoc**), Virtual Conference, October 2020. DOI: 10.1145/3397166.3409132. Selected for showcase by the SIGMOBILE Research Highlights Committee;
- S. D'Oro, L. Bonati, **F. Restuccia**, M. Polese, M. Zorzi and T. Melodia, "Sl-EDGE: Network Slicing at the Edge," *Proc. of ACM International Symposium on Theory, Algorithmic Foundations, and Protocol Design for Mobile Networks and Mobile Computing* (**ACM MobiHoc**), Virtual Conference, October 2020. DOI: 10.1145/3397166.3409133.
- G. Maselli, M. Piva and **F. Restuccia**, "HyBloSE: Hybrid Blockchain for Secure-by-Design Smart Environments," *Proc. of ACM Workshop on Cryptocurrencies and Blockchains for Distributed Systems* (**CryBlock**, co-located with **ACM MobiCom**), October 2020. DOI: 10.1145/3410699.3413793.
- **F. Restuccia** and T. Melodia, "DeepWiERL: Bringing Deep Reinforcement Learning to the Internet of Self-Adaptive Things," *Proc. of the IEEE International Conference on Computer Communications* (**IEEE INFOCOM**), Beijing, China, April 2020. DOI: 10.1109/INFOCOM41043.2020.9155461.
- A. Al-Shawabka, **F. Restuccia**, S. D'Oro, T. Jian, B. Costa Rendon, N. Soltani, J. Dy, K. Chowdhury, S. Ioannidis and T. Melodia, "Exposing the Fingerprint: Dissecting the Impact of the Wireless Channel on Radio Fingerprinting," *Proc. of the IEEE International*

Conference on Computer Communications (**IEEE INFOCOM**), Beijing, China, April 2020. DOI: 10.1109/INFOCOM41043.2020.9155259.

- R. Guida, N. Dave, **F. Restuccia**, E. Demirors, and T. Melodia, "U-Verse: A Miniaturized Platform for End-to-End Closed-Loop Implantable Internet of Medical Things Systems," *Proc. of the ACM Conference on Embedded Networked Sensor Systems* (**ACM SenSys**), pp. 311-323, New York, NY, USA, November 2019. DOI: 10.1145/3356250.3360026.
- M. Polese, **F. Restuccia**, A. Gosain, J. M. 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," *Proc. of the ACM Workshop on Millimeter-Wave Networks and Sensing Systems* (**ACM mmNets**) co-located with **ACM MobiCom**, pp. 27-32, Los Cabos, Mexico, October 2019. DOI: 10.1145/3349624.3356764.
- K. Sankhe, **F. Restuccia**, S. D'Oro, T. Jian, Z. Wang, A. Al-Shawabka, J. Dy, T. Melodia, S. Ioannidis, and K. Chowdhury, "Impairment Shift Keying: Covert Signaling by Deep Learning of Controlled Radio Imperfections," *Proc. of the IEEE/AFCEA Military Communications Conference* (**MILCOM 2019**), Norfolk, Virginia, November 2019. URL: 10.1109/MILCOM47813.2019.9021079.
- **F. Restuccia**, S. D'Oro, A. Al-Shawabka, M. Belgiovine, L. Angioloni, S. Ioannidis, K. Chowdhury and T. Melodia, "DeepRadioID: Real-Time Channel-Resistent Optimization of Deep Learning-based Radio Fingerprinting Algorithms," *Proc. of the ACM International Symposium on Mobile Ad Hoc Networking and Computing* (**ACM MobiHoc**), pp. 51-60, Catania, Italy, July 2019. DOI: 10.1145/3323679.3326503.
- L. Zhang, **F. Restuccia**, T. Melodia and S.M. Pudlewski, "Jam Sessions: Analysis and Experimental Evaluation of Advanced Jamming Attacks in MIMO Networks," *Proc. of the ACM International Symposium on Mobile Ad Hoc Networking and Computing* (**ACM MobiHoc**), pp. 61-70, Catania, Italy, July 2019. DOI: 10.1145/3323679.3326504.
- **F. Restuccia** and T. Melodia, "Big Data Goes Small: Real-Time Spectrum-Driven Embedded Wireless Networking Through Deep Learning in the RF Loop," *Proc. of the IEEE International Conference on Computer Communications* (**IEEE INFOCOM**), pp. 2152-2160, Paris, France, April 2019 (**Best In-session Presentation Award**). DOI: 10.1109/INFOCOM.2019.8737459.
- S. D'Oro, **F. Restuccia**, A. Talamonti, and T. Melodia, "The Slice Is Served: Enforcing Radio Access Network Slicing in Virtualized 5G Systems," *Proc. of the IEEE International Conference on Computer Communications* (**IEEE INFOCOM**), pp. 442-450, Paris, France, April 2019 (**Best In-session Presentation Award**). DOI: 10.1109/INFOCOM.2019.8737481.
- S. D'Oro, **F. Restuccia**, and T. Melodia, "Hiding Data in Plain Sight: Undetectable Wireless Communications Through Pseudo-Noise Asymmetric Shift Keying," *Proc. of the IEEE International Conference on Computer Communications* (**IEEE INFOCOM**), pp. 1585-1593, Paris, France, April 2019 (**Best In-session Presentation Award**). DOI: 10.1109/INFOCOM.2019.8737581.
- **F. Restuccia**, E. Demirors, and T. Melodia, "iSonar: Software-defined Underwater Acoustic Networking for Amphibious Smartphones," *Proc. of the ACM International Conference on Underwater Networks & Systems* (**ACM WUWNet**), pp. 1-9, Halifax, Canada, November 2017. DOI: 10.1145/3148675.3148710.
- L. Zhang, **F. Restuccia**, T. Melodia, and S. Pudlewski, "Learning to Detect and Mitigate Cross-layer Attacks in Wireless Networks: Framework and Applications", *Proc. of the IEEE Conf. on Communications and Network Security* (**IEEE CNS**), pp. 1-9, Las Vegas, Nevada, October 2017. DOI: 10.1109/CNS.2017.8228631.

- **F. Restuccia** and S. K. Das, "FIDES: A Trust-based Framework for Secure User Incentivization in Participatory Sensing", *Proc. of the IEEE International Symposium on a World of Wireless, Mobile, and Multimedia Networks (***IEEE WoWMoM***)*, pp. 1-9, Sydney, Australia, June 2014. DOI: 10.1109/WoWMoM.2014.6918972.
- **F. Restuccia**, G. Anastasi, M. Conti, S. K. Das, "Performance Analysis of a Hierarchical Discovery Protocol for WSNs with Mobile Elements", *Proc. of the IEEE International Symposium on a World of Wireless, Mobile and Multimedia Networks* (**IEEE WoWMoM**), pp. 1-9, San Francisco, California, June 2012. DOI: 10.1109/WoWMoM.2012.6263708.
- K. Kondepu, **F. Restuccia**, G. Anastasi, M. Conti, "A Hybrid and Flexible Discovery Algorithm for WSNs with Mobile Elements", *Proc. of the IEEE International Symposium on Computers and Communications* (**IEEE ISCC**), pp. 295-300, Cappadocia, Turkey, July 2012. DOI: 10.1109/ISCC.2012.6249311.

AWARDED PATENTS

- **F. Restuccia**, S. D'Oro and T. Melodia, "Real-Time Channel-Resilient Optimization of Radio Fingerprinting," U.S. Application No.: 16/832,741, PD: May 29th, 2019.

PATENT APPLICATIONS

- F. Meneghello, M. Rossi and **F. Restuccia**, "Robust Wi-Fi Radio Fingerprinting Through MU-MIMO CSI Feedback Deep Learning," U.S. Application No.: 63/261,655, PD: Sept 24, 2021.
- L. Baldesi, T. Melodia, and **F. Restuccia**, "Channel-Aware Reactive Mechanism (ChARM),", U.S. Application No.: 63/244,192, PD: Sept 14, 2021.
- N. Bahadori and **F. Restuccia**, "ReWiS: Reliable Wi-Fi Sensing Through Few-Shot Multi-Antenna Multi-Receiver CSI Learning," U.S. Application No.: 63/237,109, PD: August 25, 2021.
- S. D'Oro, **F. Restuccia**, and T. Melodia, "Methods for Reliable Classification of Wireless Signals," U.S. Application No.: 17/650,686 , PD: February 23th, 2021 (full patent filed).
- M. Polese, **F. Restuccia** and T. Melodia, "Coordination-Free mmWave Beam Management With Deep Waveform Learning," U.S. Application No.: 17/481,378, PD: September 23, 2020 (full patent filed).
- D. Uvaydov, R. Guida, **F. Restuccia**, and T. Melodia, "Embedded Networked Deep Learning for Implanted Medical Devices," U.S. Application No: 17/176,229, PD: February 14, 2021 (full patent filed).
- L. Bonati, S. D'Oro, **F. Restuccia** and T. Melodia, "Methods for Multi-Access Edge Computing Network Slicing in 5G Networks, " U.S. Application No.: 17/365,070, PD: July 17, 2020 (full patent filed).
- T. Melodia, L. Bonati, S. D'Oro and **F. Restuccia**, "Private 5G Cellular Connectivity as a Service Through Full-Stack Wireless Steganographyation," U.S. Application 17/316,773, PD: May 11, 2020.
- **F. Restuccia**, S. D'Oro and T. Melodia, "Neural Network for Adversarial Deep Learning in Wireless Systems," U.S. Application No.: 17/128,437, PD: December 23th, 2019 (full patent filed).
- **F. Restuccia** and T. Melodia, "Mechanism for Embedded Deep Reinforcement Learning in Wireless Internet of Things Devices," U.S. No.: PCT/US2020/051597, PD: September 20th, 2019 (full patent filed).
- **F. Restuccia** and T. Melodia, "Deep Learning-Based Polymorphic Platform," U.S. Application No.: PCT/US2020/019411, PD: April 26th, 2019 (full patent filed).

- S. D'Oro, **F. Restuccia** and T. Melodia, "Methods for the Enforcement of Network Slicing Policies in Virtualized Cellular Networks," U.S. Application No.: PCT/US2020/014896, PD: January 23rd, 2019 (full patent filed).
- **F. Restuccia** and T. Melodia, "Real-Time Cognitive Wireless Networking Through Deep Learning in Transmission and Reception Communication Paths, " U.S. Application No.: 16/591,772, PD: October 3rd, 2018 (full patent filed).
- **F. Restuccia**, E. Demirors, and T. Melodia, "Underwater Ultrasonic Communication System and Method, " U.S. Application No.: 15/992,304, PD: May 30th, 2018 (full patent filed).

FUNDED RESEARCH PROJECTS

- Collaborative Research: NeTS: Small: Reliable Task Offloading in Mobile Autonomous Systems Through Semantic MU-MIMO Control, National Science Foundation (NSF), lead PI (co-PI institution: UC Irvine), 10/1/2021–9/30/2024, $415,000.
- Collaborative Research: CCRI: New: RFDataFactory: Principled Dataset Generation, Sharing and Maintenance Tools for the Wireless Community, National Science Foundation, co-PI, (co-PI Institution: Rice University), 10/1/2021–9/30/2024, $1,800,000.
- Visiting Faculty Research Program (VFRP) Award, Air Force Research Laboratory (AFRL), 5/3/2021–8/31/2021, $14,832, 2021.
- Mentored Award: Tier 1: Shapeshifting Neural Networks for Secure-by-Design Hardware-based Deep Learning in Mobile Autonomous Systems, Provost's Office, Northeastern University, $50,000, April 15th, 2021 (25 awarded out of 73 submissions).
- Entrepreneurial Lead (EL), Innovation Corps (I-corps) Program, $50,000, National Science Foundation, 2014.

AWARDS AND RECOGNITIONS

- ACM SIGMOBILE Research Highlights for the PolymoRF paper in MobiHoc 2020 (only 4 papers selected out of the top 6 SIGMOBILE conferences in 2020).
- Elevation to IEEE Senior Member, July 2nd, 2021.
- Distinguished Member of IEEE INFOCOM 2021 Technical Program Committee.
- Distinguished Member of IEEE INFOCOM 2020 Technical Program Committee.
- Best-in-Session Presentation, IEEE INFOCOM 2019.
- Mario Gerla Award for Young Investigators in Computer Science, Italian Scientists and Scholars of North America Foundation (ISSNAF), 2019.

WORK POSITIONS

Associate Research Scientist
Department of Electrical and Computer Engineering, Northeastern University
February 2018 - August 2020

Postdoctoral Research Associate
Department of Electrical and Computer Engineering, Northeastern University
January 2017 - January 2018

Graduate Research Assistant
Department of Computer Science, Missouri S&T, August 2013 - December 2016
Department of Computer Science and Engineering, UT Arlington, August 2012 - August 2013

Research Assistant
Institute of Informatics and Telematics, National Research Council, Italy
November 2011 - July 2012

TEACHING EXPERIENCE

- EECE 5698 (now 5155) - Wireless Sensor Networks and the Internet of Things - Graduate class, Northeastern University, Spring 2018, Spring 2021, Fall 2021, Spring 2022

PROFESSIONAL SERVICE

- **TPC Chair**: IEEE IQ2S Workshop (w/ IEEE PerCom 2018), ACM WiNTECH 2021 Workshop (w/ ACM MobiCom 2021).
- **TPC Member**: IEEE INFOCOM (2018-2022); ACM MobiHoc (2020-2022); IEEE PerCom (2022); IEEE ICDCS (2022), IEEE SECON (2020-2021); IEEE/ACM IWQoS (2020-2022); IEEE LCN (2016-2022); IEEE SMARTCOMP (2017, 2022); IEEE WoWMoM (2017-2021); IEEE GlobeCom (2017-2021); IEEE NoF (2017-2019), IEEE 5G World Forum (2018-2021), IEEE MASS (2018-2021), ACM MSWiM (2018-2019), IEEE WCNC (2020-2022), IEEE DCOSS (2021-2022), IEEE ICC (2022).
- **Publicity Chair**: IFIP/IEEE WiOpT (2022), IEEE WoMMoM (2022), IEEE PerCom (2021), IEEE SECON (2019, 2021), ITC 30 (2018), ACM MSWiM (2018), IEEE LANMAN (2018), ACM WINTECH (2020), IFIP Networking (2021).
- **Demo/Poster Chair**: ACM MobiHoc (2020).
- **Guest Editor**: IEEE Communications Magazine, Special Issue on Networking Technologies to Combat the COVID-19 Pandemic, 2021; Computer Networks, Special Issue on Machine Learning and Artificial Intelligence for the Internet of Things, 5G and Beyond (Lead Editor), 2022.
- **Conference Reviewer**: IEEE INFOCOM (2013-2017); IEEE PerCom (2013-2014, 2016); IEEE ICDCS (2013-2014, 2017); IEEE MASS (2013); IEEE ICNP (2013); IEEE LCN (2015); IEEE CNS (2017); IEEE MSWiM (2017), ACM MobiHoc (2017-2019), ACM MobiCom (2019-2020).
- **Journal Reviewer**: IEEE Transactions on Mobile Computing (TMC); IEEE Transactions on Communications (TCOM); IEEE Transactions on Wireless Communications (TWC); IEEE Journal on Selected Areas in Communications (JSAC); IEEE Transactions on Information Forensics and Security (TIFS); IEEE Transactions on Network Science and Engineering (TNSE); IEEE Transactions on Parallel and Distributed Systems (TPDS); IEEE/ACM Transactions on Networking (TNET); IEEE Network Magazine (MNET); IEEE Transactions on Vehicular Technology (TVT); IEEE Transactions on Dependable and Secure Computing (DSC); IEEE Internet of Things Journal (IoT-J); IEEE Wireless Communications Letters (WCL); IEEE Wireless Communications Magazine (WCM); IEEE Communications Letters (CL); IEEE Sensors Journal; IEEE Internet Computing (IC); ACM Transactions on Sensor Networks (TOSN); IEEE Transactions on Molecular, Biological, and Multi-Scale Communications (TMBMC); Computer Networks (COMNET); Ad-Hoc Networks (ADHOC); Computer Communications (COMCOM); Pervasive and Mobile Computing (PMC); Wireless Networks (WINET); Sensors; Journal of Parallel and Distributed Computing (JPDC).

Invited Talks

- Engineering Department, University of Trento, Italy, December 16, 2021.
- Engineering Department, University of Padua, Italy, December 15, 2021.
- Engineering Department, University of Brescia, Italy, December 14, 2021.
- Engineering Department, Polytechnic of Milan, Italy, December 13, 2021.
- Engineering Department, Polytechnic of Turin, Italy, December 10, 2021.
- Institute of Communication, Information and Perception Technologies, Scuola Superiore Sant'Anna (TeCIP Institute), Pisa, Italy, December 9, 2021.
- Engineering Department, University of Pisa, Pisa, Italy, December 7, 2021.

- Institute of Informatics and Telematics, National Research Council (IIT-CNR), Pisa, Italy, December 7, 2021.
- ECE Department, University of Rome "Tor Vergata", Rome, Italy, December 6, 2021.
- CS Department, University of Rome "La Sapienza", Rome, Italy, December 6, 2021.
- CS Department, University of California, Irvine, November 18, 2021.
- ECE Department, Michigan State University, November 11, 2021.
- IEEE Systems, Man and Cybernetics Society (SMCS), Italy Chapter, Mar 5, 2021.
- CS Department, Saint Louis University, Feb 15, 2021.
- IEEE Communications Society, Mohawk Valley Chapter, Dec 21, 2020.
- ECE Department, University of Central Florida, Mar 31, 2020.
- ECE Department, University of Texas at Dallas, Mar 4, 2020.
- ECE Department, Worcester Polytechnic Institute, Dec 12, 2019.

PROFESSIONAL DEVELOPMENT

- Attended Faculty Search Committee Workshop on Strategies and Tactics for Recruiting to Improve Diversity and Excellence (STRIDE), Northeastern University, November 2020.
- Attended Racial Literacy webinar series, Presidential Council on Diversity and Inclusion at Northeastern University, October 2020.
- Mentored two undergraduates as part of the Undergraduate Program for Leaders In Future Transformation (UPLIFT) program at the College of Engineering of Northeastern University. This program encourages undergraduate research by first-semester students, and fosters a pipeline for incoming undergraduates in engineering (Fall 2021).

PROFESSIONAL REFERENCES

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