Mauro Belgiovine

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PhD student in Electrical and Computer Engineering at Northeastern University. Expertise in Deep Learning applications in Wireless Communication systems. Proficient in custom Deep Learning model design, simulation of wireless communication systems (PHY, MAC layers), data analysis and data manipulation. Other research interest includes mobile and distributed system, swarm intelligence, heterogeneous computing.

Working Experience

R&I INTERN, INTERDIGITAL, INC.; CONSHOHOCKEN, PA – FEB 2021 - JUL 2021

Development, analysis and simulation of AI/ML algorithms for massive MIMO Hybrid Beam Forming in mmWave band.

RESEARCH ASSISTANT GRAD. STUDENT, NORTHEASTERN U.; BOSTON, MA – JAN 2018 - NOW

Researcher in the field of Deep Learning applied to next generation Wireless Communication Systems, under the supervision of Prof. Kaushik Chowdhury. During my first year, I have contributed to a DARPA sponsored Radio Fingerprinting project in the context of RFMLS challenge (see *Publications*).

SOFTWARE ENGINEER, T3LAB; BOLOGNA, IT – SEP 2017 - DEC 2017

Multi-thread (Posix) system development on ARM-based Linux board. Development of a customisable UI for OPC-UA clients using C# and .NET framework.

SOFTWARE ENGINEER INTERN, DATALOGIC ADC; PASADENA, CA – AUG 2016 - JAN 2017

Developed a general and scalable software solutions for OCR systems using Deep Neural Networks (implemented in Python/TensorFlow). Project's documentation has contributed to the content of my Master Degree Thesis in Computer Science and resulted in a patent application by the company (see *Publications*).

SOFTWARE ENGINEER, INFN - NATIONAL INST. OF NUCLEAR PHYSICS; BOLOGNA, IT – AUG 2012 - NOV 2014

C/C++/CUDA/OpenCL developer in the field of General Purpose computing on GPU (GPGPU), Heterogeneous Computing and HPC. Part of my work has been presented at TIPP14 (Amsterdam) and GPUHEP2014 (Pisa) conferences (see *Publications*).

Relevant Publications

- ***M. Belgiovine**, K. Sankhe, C. Bocanegra, D. Roy, K. Chowdhury, "Deep Learning at the Edge for Channel Estimation in Beyond-5G Massive MIMO", IEEE Wireless Communication Magazine (April 2021).*
- *B. Salehi, **M. Belgiovine**, S. Sanchez, J. Dy, S. Ioannidis, and K. R. Chowdhury, " Machine Learning on Camera Images for Fast mmWave Beamforming," IEEE International Conference on Mobile Ad Hoc and Sensor Systems (MASS), 2020*
- *K. Sankhe, **M. Belgiovine**, F. Zhou, S. Riyaz, S. Ioannidis, K. Chowdhury, "ORACLE: Optimized Radio clAssification through Convolutional neuraL nEtworks", Proceedings of IEEE INFOCOM 2019*

- *K. Sankhe, **M. Belgiovine**, F. Zhou, L. Angioloni, F. Restuccia, S. D'Oro, et. al., "No Radio Left Behind: Radio Fingerprinting Through Deep Learning of Physical-Layer Hardware Impairments", IEEE Transactions on Cognitive Communications and Networking 2019*
- *F. Restuccia, S. D'Oro, A. Al-Shawabka, **M. Belgiovine**, L. Angioloni, et. al. "DeepRadioID: Real-Time Channel-Resilient Optimization of Deep Learning-based Radio Fingerprinting Algorithms", Proceedings of ACM MobiHoc 2019*
- *L. Goncalves, **M. Belgiovine**, "Systems and Methods For Robust Industrial Optical Character Recognition", USAN: 16/024,910, Datalogic ADC Patent*

Education

Northeastern University, Boston MA – June 2023 (Estimated)
PhD in Computer Engineering
University of Bologna, Bologna IT – July 2017
Master's Degree in Computer Science - Wireless Systems and Networking
Final evaluation: 110 / 110 cum laude
University of Bologna, Bologna IT – March 2013
Bachelor's Degree in Computer Science

References

Kaushik Chowdhury, Professor in Electrical and Computer Engineering department at Northeastern University, Boston (MA). krc@ece.neu.edu
Luis Goncalves, R&D Machine Vision Lab director, Datalogic ADC, Pasadena (CA). luis.goncalves@datalogic.com
Lorenzo Rinaldi, Professor at University of Bologna and INFN Research Associate, Bologna (IT). lorenzo.rinaldi@unibo.it

Languages

Italian - Mother tongue
English - Proficient / C2 – TOEFL score: 95/120

Technical Skills

Deep Learning (Keras/TensorFlow), Machine Learning, Wireless communication, Networking, HPC, Distributed Computing, Mobile Systems, System simulation, Computer Security. Software development in Unix (Linux, Mac OS X) environment. Web applications development (HTML5+CSS3, PHP5, MySql, JS/jQuery) based on LAMP server architecture.
Programming languages: Python, C/C++, CUDA, OpenCL, Java, Arduino, Omnet++, Bash, MPI.

Relevant courses

ESC13 "*Fifth INFN International School on Architectures, tools and methodologies for developing efficient large scale scientific computing applications*".