

# Lorenzo Brigato






## EXPERIENCE

FEBR 2022-JUN 2022	<b>Researcher</b>	 SAPIENZA UNIVERSITY OF ROME, DIAG	 European Project
NOV 2018-JAN 2022	<b>PhD candidate</b>	 SAPIENZA UNIVERSITY OF ROME, DIAG	 Engineering in Computer Science
OCT 2019-FEB 2021	<b>Teaching assistant</b>	 SAPIENZA UNIVERSITY OF ROME, DIAG	 Machine Learning
JAN-DEC 2019	<b>Teaching assistant</b>	 SAPIENZA UNIVERSITY OF ROME, DIAG	 Programming techniques in C
MAR-JUN 2018	<b>Research Intern</b>	 HES-SO VALAIS WALLIS	 Sierra, Switzerland













## EDUCATION

OCT 2018	 MSc in AI AND ROBOTICS	 Sapienza University of Rome	%: 110/110
JULY 2016	 BSc in ENGINEERING SCIENCES	 Tor Vergata University of Rome	%: 109/110
JUNE 2013	Exchange student	 Tell City High School	 Indiana, USA





## AWARDS AND SCHOLARSHIPS

JULY 2019	 Best Engineering Paper Finalist, RoboCup 2019
MAY 2019	 Won scholarship for young researchers under Sapienza Research Call
OCT. 2018	 Won PhD scholarship under the call for PhD applications
MARCH 2018	 Received grant for internship at Hes-so Valais Wallis
JULY 2014	 Exemption from payment of the additional fee for outstanding ENGINEERING SCIENCES students

## PUBLICATIONS

2021	<b>Data-Efficient Image Classification: Survey and Benchmark</b> [Under review] <u>L. BRIGATO</u> , B. BARZ, L. IOCCHI and J. DENZLER	Int. Journal	
2021	<b>A Strong Baseline for the VIPriors Data-Efficient Image Classification Challenge</b> B. BARZ, <u>L. BRIGATO</u> , L. IOCCHI and J. DENZLER	arXiv	
2021	<b>Tune It or Don't Use It: Benchmarking Data-Efficient Image Classification</b> <u>L. BRIGATO</u> , B. BARZ, L. IOCCHI and J. DENZLER	ICCV Workshops	 
2021	<b>Exploiting Time Dynamics for One-Class and Open-Set Anomaly Detection</b> <u>L. BRIGATO</u> , R. SARTEA, S. SIMONAZZI, A. FARINELLI, L. IOCCHI and C. NAPOLI	ICAISC	
2021	<b>On the Effectiveness of Neural Ensembles for Image Classification with Small Datasets</b> <u>L. BRIGATO</u> , L. IOCCHI	arXiv	
2020	<b>A Close Look at Deep Learning with Small Data</b> <u>L. BRIGATO</u> and L. IOCCHI	ICPR	 
2019	<b>A Comparative Analysis on the use of Autoencoders for Robot Security Anomaly Detection</b> M. OLIVATO*, O. COTUGNO*, <u>L. BRIGATO*</u> , D. BLOISI, A. FARINELLI and L. IOCCHI	IROS	
2019	<b>RoboCup@Home-Objects: Benchmarking Object Recognition for Home Robots</b> N. MASSOUH, <u>L. BRIGATO</u> and L. IOCCHI	RoboCup	
2019	<b>Analyzing the trade-off between training session time and performance in myoelectric hand gesture recognition during upper limb movement</b> M. COGNOLATO*, <u>L. BRIGATO*</u> , Y. DICENTE, M. ATZORI and H. MÜLLER	ICORR	
2018	<b>QoE-aware UAV flight path design for mobile video streaming in HetNet</b> S. COLONNESE, A. CARLESIMO, <u>L. BRIGATO</u> and F. CUOMO	SAM Workshop	

## COMPUTER SKILLS

Languages:	PYTHON, MATLAB, JAVASCRIPT, C	Operating Systems:	 
Deep Learning libraries:	PyTorch, Tensorflow, Keras	Other Software:	 

## LANGUAGES

ITALIAN:	Mothertongue
ENGLISH:	Fluent,  CAMBRIDGE ENGLISH ADVANCED (CAE)

## ATTENDED CONFERENCES AND WORKSHOPS

2021	International Conference on Computer Vision Oral presentation	ICCV	Virtual
2020	Thirty-fourth Conference on Neural Information Processing Systems	NIPS	Virtual
2020	International Conference on Pattern Recognition Oral presentation	ICPR	Virtual
2019	IEEE/RSJ International Conference on Intelligent Robots and Systems Oral presentation	IROS	In-Person
2019	Italian Conference on Robotics and Intelligent Machines Poster presentation	I-RIM 3D	In-Person
2019	Fourth International Workshop on Intrinsically Motivated Open-ended Learning	IMOL	In-Person

## CO-SUPERVISED MASTER THESES

2020	Augmented Network Reconstructions for Small Datasets S. ALAOUJ		Academic thesis
2020	Development of a decision support system based on multi-model predictions integrated in an electronic-CaseReportForm I. MAZZOLA		Technology transfer
2020	Visual Perception for an Interactive Robot Playing Card Games S. OSMANAJ		Academic thesis
2019	A Comparative Analysis on the use of Autoencoders for Robot Security Anomaly Detection O. COTUGNO		Conference publication
2019	Automatic Italian news classification through Recurrent Neural Network F. MASCOMA		Technology transfer
2019	Automatic Italian news classification relevant to the Italian police G. GIUGNO		Technology transfer

## ADDITIONAL DETAILS

**PhD candidate.** During my PhD I performed research in machine learning and robotics with a particular emphasis on the fields of data-efficient image classification (i.e., datasets having  $< 100$  samples per class) and anomaly detection. Among the most important accomplishments for the first area, I recognize the first literature survey and dedicated benchmark to foster research and consolidate the community; and the broad studies about the influence of model complexity, data augmentation, and ensembles in these rarely studied settings. Concerning the second area, I produced two papers developing techniques to detect anomalies directly from system logs of cybernetic systems such as robots. I presented my work at 4 computer vision and robotics conferences (ICCV, ICPR, IROS, and IRIM) and also collaborated on different publications with researchers from the University of Jena (Germany) and the University of Verona (Italy). The collaboration with German colleagues was remote-only because of the pandemic.

To support my research, I won a fully-funded PhD scholarship and a research grant with which I acquired an RTX Nvidia 3070 GPU. Additionally, I developed AI software for a project resulting from a collaboration with a surveillance and security company. I won a best engineering paper award at Robocup 2019 for research concerning benchmarking image recognition for domestic robots. I had the opportunity to co-supervise 6 Master's theses, including three of them resulting from collaborations with external bodies or companies, and one of them that gave rise to a publication at IROS 2019. I gained additional knowledge by participating in the international summer school on intrinsically motivated learning, held in Frankfurt in 2019, and by passing three additional exams for the PhD course, i.e., NLP, Reasoning Agents, and Human-Robot Interaction.

**Teaching assistant.** I have been a teaching assistant for the courses of Machine Learning and Programming Techniques in C. For the first, I advised students in weekly tutoring sessions, designed and planned weekly exercises and multiple exam homework. I also lectured seminars on advanced research topics of computer vision and anomaly detection, and I am foreseeing publishing work regarding experiments of crowd-sourced AI. For the second, I designed and planned weekly exercises, graded exams exercises for classes of 100+ students. To save time, I developed software that automatically scores programming exercises of students.

**Education.** I have been a Master's student in Artificial Intelligence and Robotics at the Sapienza University of Rome from which I graduated with 110/110. During the last semester, I have been a research intern at Hes-so Valais Wallis (Switzerland) to study machine learning methods applied to electromyography-based hand robotic prostheses. From the work developed in this internship, I published a paper at a rehabilitation robotics conference (ICORR 2019). I have obtained my three-year Bachelor's degree at the Tor Vergata University of Rome in Engineering Sciences with 109/110, receiving the exemption from payment of the additional fee for outstanding students.

**Interests and activities.** I enjoy reading about future technologies concerning space, AI & Robotics, and neuroscience. I also like playing sports and traveling.