Paolo Didier Alfano

Current position

2023 - Now   **Postdoctoral**, *Italian Institute of Technology*, Genoa.

I'm currently researching efficient machine learning methods for dynamical systems involving agent-environment interactions. Our focus lies on two branches of machine learning algorithms for robotics:
- Diffusion techniques for object surface recognition in vision-based tactile sensors
- Computer vision techniques for real-time action recognition

Education

2019 - 2023   **Ph.D.**, *Genoa University*, Genoa, *Computer Science*.

Ph.D. in statistical learning applied to computer vision, emphasizing transfer learning and domain adaptation under resource constraints (e.g., time, space, data). I conducted an extensive and in-depth investigation into the applicable statistical techniques within the field of computer vision.
- Ph.D. thesis: *Efficient machine learning with resource constraints*.

2016 - 2019   **Master Degree**, *Turin University*, Turin, *Computer Science*.

Artificial Intelligence curriculum, focused on artificial intelligence and machine learning.
- Final mark: 110/110 magna cum laude
- Master thesis: *Adapting a recurrent network to tonal analysis of audio files*. A study on techniques, methodologies, and models associated with speech recognition to predict sequences of chords played within audio tracks.

2013 - 2016   **Bachelor Degree**, *Pisa University*, Pisa, *Computer Science*.

- Final mark: 104/110
- Bachelor thesis: *Deep Learning Model for graphics accelerator*. An overview over convolutional deep learning models. The results were presented as demo during the Nvidia's GPU Europe technology conference 2016

Internships, Schools, Workshops

2023   **Workshop**, *Primo Workshop 2023*, University of Bari, Bari, Topic: Machine Learning, Inverse problems & Optimization.

The PRIMO Workshop offers an overview on topics within the research areas of imaging science, deep learning and non linear optimization to early-career researchers.

2022   **Summer School**, *International Computer Vision Summer School*, University of Catania, Catania, Topic: Deep Learning & Computer vision.

The International Computer Vision Summer School (ICVSS) offers an exploration of cutting-edge Computer Vision research. Experts from academia and industry deliver courses on theory, practical problem-solving, and commercial applications.

2018 **Internship**, *Summer Student program at the Fermi National Accelerator Laboratory*, FERMILAB, Chicago, Topic: Deep Learning & Cybersecurity.
A two-month internship where I developed deep learning algorithms for CAPTCHA image analysis. Our work led to recommendations for creating stronger CAPTCHAs and expanded our understanding of applying deep learning to malicious code detection.

Publications and Preprints

Sim2Real Bilevel Adaptation for Object Surface Classification using Vision-Based Tactile Sensors.
joint with GM. Caddeo, A. Maracani, NA. Piga L. Rosasco, L. Natale
in Arxiv preprint, submitted @ICRA2023

Top-Tuning: a study on transfer learning for an efficient alternative to fine tuning for image classification with fast kernel methods.
joint with VP. Pastore, L. Rosasco, F. Odone
in Image and Vision Computing Journal, volume 142

An unsupervised learning approach to resolve phenotype to genotype mapping in budding yeasts vacuoles.
joint with VP. Pastore et al.
in International Conference of Image Analysis and Processing 2023 (ICIAP 2023)

Efficient Unsupervised Learning for Plankton Images.
joint with M. Rando, M. Letizia, F. Odone, L. Rosasco and VP. Pastore
in International Conference on Pattern Recognition 2022 (ICPR2022)

Teaching

2022 *Advanced Machine Learning*, Master Degree in Computer Science, laboratory assistant, Genoa University.

2021 *Introduction to Deep Learning and Convolutional Neural Networks*, Introductory lessons for corporate students through the MAIA program.

2021 *Algorithm and data structure*, Bachelor Degree in Computer Science, exam assistant, Genoa University.

2021 *Advanced Machine Learning*, Master Degree in Computer Science, laboratory assistant, Genoa University.

2020 *Introduction to Deep Learning and Convolutional Neural Networks*, Introductory lessons for corporate students through the MAIA program.

2020 *Algorithm and data structure*, Bachelor Degree in Computer Science, exam assistant, Genoa University.

2020 *Advanced Machine Learning*, Master Degree in Computer Science, laboratory assistant, Genoa University.

Technical skills

o Programming Languages: C, C++, Python, Java, F#, HTML, CSS, JavaScript, Prolog, CLINGO, CLIPS, Ocaml, SQL, MATLAB.
o Computer Science: artificial intelligence, machine learning, neural networks, data structures, algorithms, logic, operating systems, computer architectures, computer networks, databases.

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o Mathematics: numerical analysis, calculus, proability theory and statistics
o General Physics and Chemistry

Languages

Italian	Mother Tongue				

English	Listening	Reading	Spoken Interaction	Spoken Production	Writing
	C1	C1	C1	C1	C1

French	Listening	Reading	Spoken Interaction	Spoken Production	Writing
	A2	A2	A1	A1	A1