

Francesca Pistilli

Assistant Professor (*non tenure-track*)

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Research Interests

Graph learning for robotics, human behaviour understanding, egocentric vision, human-robot cooperation, 3D learning, efficient deep learning, implicit neural representations.

Short Research Description

My research is focused on the development of deep learning solutions to process and reason about human behaviour, surroundings scenes status, and their interplay. Particular attention is given to investigating how human examples can foster a fruitful human-robot cooperation, for example by providing structured representations of human daily living activities for robot learning.

Working Experience

- Feb.2024 – **Assistant Professor (non tenure-track)**, *Politecnico di Torino*.
present RTD-A at Department of Control and Computer Engineering (DAUIN), research activities within the Visual and Multimodal Applied Learning (VANDAL) Lab. Main field: human behavioural understanding for robot learning
- Feb.2023 – **PostDoc Researcher**, *Politecnico di Torino*.
Jan.2024 Researcher at Visual and Multimodal Applied Learning (VANDAL) Lab. Main field: graph learning for robotics and video understanding.

Education

- Nov.2019 – **Ph.D, Electrical, Electronics and Communication Engineering**, *Politecnico di Torino*.
June.2023 Thesis title: "Learning robust and efficient point cloud representations.", supervisor: prof. Enrico Magli, Image Processing and Learning (IPL) group.
- 2018–2020 : **M.Sc., Electrical and Computer engineering. GPA: 4.0**, *University of Illinois at Chicago*.
Enrolled in a double degree program between the University of Illinois at Chicago and Politecnico di Torino.
- 2017–2019 : **M.Sc. Electronics Engineering. Final Grade: 110L/110**, *Politecnico di Torino*.
- 2014–2017 : **B.Sc. Electronics Engineering. Final Grade: 100/110**, *Politecnico di Torino*.

Publications

- 2026 **Francesca Pistilli**, Simone Alberto Peirone, and Giuseppe Averta. Learning to evolve scenes: Reasoning about human activities with scene graphs. *arXiv preprint arXiv:2607.02425*, 2026.
- 2026 Andrea Protopapa, Davide Buoso, **Francesca Pistilli**, Georgia Chalvatzaki, and Giuseppe Averta. Gordon: Graph-based object-centric rewards for decomposition of long-horizon manipulation. *arXiv preprint arXiv:2608.03753*, 2026.
- 2026 Davide Buoso, Andrea Protopapa, Stefano Di Carlo, **Francesca Pistilli**, and Giuseppe Averta. Gap: Geometric anchor pre-training for data-efficient visuomotor learning of manipulation tasks. *IEEE/RSJ International Conference on Intelligent Robots and Systems (IROS)*, 2026.
- 2025 Simone Alberto Peirone, **Francesca Pistilli**, and Giuseppe Averta. Hiero: understanding the hierarchy of human behavior enhances reasoning on egocentric videos. In *Proceedings of the IEEE/CVF International Conference on Computer Vision (ICCV)*, 2025.
- 2025 Simone Alberto Peirone, **Francesca Pistilli**, Antonio Alliegro, Tatiana Tommasi, and Giuseppe Averta. Hier-egopack: Hierarchical egocentric video understanding with diverse task perspectives. *IEEE Transactions on Pattern Analysis and Machine Intelligence*, 2025.

- 2025 Rupert Mitchell, Antonio Alliegro, Raffaello Camoriano, Dustin Carrion-Ojeda, Antonio Carta, Georgia Chalvatzaki, Nikhil Churamani, Carlo D'Eramo, Samin Hamidi, Robin Hesse, Fabian Hinder, Roshni Ramanna Kamath, Vincenzo Lomonaco, Subarnaduti Paul, **Francesca Pistilli**, Tinne Tuytelaars, Gido M van de Ven, Kristian Kersting, Simone Schaub-Meyer, and Martin Mundt. Continual learning should move beyond incremental classification. *arXiv preprint arXiv:2502.11927*, 2025.
- 2025 Claudia Cuttano, **Francesca Pistilli**, Fabio Cermelli, and Giuseppe Averta. Rethinking cross-modal interaction for efficient referring image segmentation. *IEEE Robotics and Automation Letters*. IEEE, 2025.
- 2025 Antonio Alliegro, **Francesca Pistilli**, Tatiana Tommasi, and Giuseppe Averta. Forescene: Forecasting human activity via latent scene graphs diffusion. *arXiv preprint arXiv:2503.06182*, 2025.
- 2024 Simone Alberto Peirone, **Francesca Pistilli**, Antonio Alliegro, and Giuseppe Averta. A backpack full of skills: Egocentric video understanding with diverse task perspectives. In *Proceedings of the IEEE/CVF conference on computer vision and pattern recognition (CVPR)*, 2024.
- 2024 Niccolò Cavagnero, Gabriele Rosi, Claudia Cuttano, **Francesca Pistilli**, Marco Ciccone, Giuseppe Averta, and Fabio Cermelli. Pem: Prototype-based efficient maskformer for image segmentation. In *Proceedings of the IEEE/CVF conference on computer vision and pattern recognition (CVPR)*, 2024.
- 2023 **Francesca Pistilli** and Giuseppe Averta. Opportunities for graph learning in robotics. In *Proceedings of I-RIM 3D Series*. I-RIM, 2023.
- 2023 **Francesca Pistilli** and Giuseppe Averta. Graph learning in robotics: a survey. *IEEE Access*. IEEE, 2023.
- 2023 Niccolò Cavagnero, Luca Robbiano, **Francesca Pistilli**, Barbara Caputo, and Giuseppe Averta. Entropic score metric: Decoupling topology and size in training-free nas. In *Proceedings of the IEEE/CVF International Conference on Computer Vision (ICCV) Workshops*, pages 1459–1468, October 2023.
- 2022 **Francesca Pistilli**, Diego Valsesia, Giulia Fracastoro, and Enrico Magli. Signal compression via neural implicit representations. In *ICASSP 2022 - 2022 IEEE International Conference on Acoustics, Speech and Signal Processing (ICASSP)*, pages 3733–3737, 2022.
- 2021 **Francesca Pistilli**, Giulia Fracastoro, Diego Valsesia, and Enrico Magli. Learning robust graph-convolutional representations for point cloud denoising. *IEEE Journal of Selected Topics in Signal Processing*, volume 15, pages 402–414, 2021.
- 2020 **Francesca Pistilli**, Giulia Fracastoro, Diego Valsesia, and Enrico Magli. Point cloud normal estimation with graph-convolutional neural networks. In *2020 IEEE International Conference on Multimedia Expo Workshops (ICMEW)*, pages 1–6, 2020.
- 2020 **Francesca Pistilli**, Giulia Fracastoro, Diego Valsesia, and Enrico Magli. Learning graph-convolutional representations for point cloud denoising. In *The European Conference on Computer Vision (ECCV)*, 2020.

Fellowships & Awards

- 2023 –present **IEEE Robotics and Automation Society** Member.
- 2020 –present **IEEE** Member.
- 2017 –lifelong **IEEE-HKN Mu Nu Chapter Member** - francesca.pistilli@hknpolito.org.
- 2020 IEEE SPS Italy Chapter **Master's Thesis Award**.
- 2020 3rd Place **IET 3MT Competition** at IEEE International Conference on Multimedia Expo (ICME).

Reviewer Activity

International Journals

- 2022- IEEE Robotics and Automation Letters
- 2019- IEEE Transactions on Image Processing
- 2019- IEEE Transactions on Multimedia

International Conferences

- 2022- International Conference on Intelligent Robots and Systems (IROS)
- 2022- International Conference on Robotics and Automation (ICRA)
- 2022- IEEE Conference on Computer Vision and Pattern Recognition (CVPR)
- 2022- International Conference on Computer Vision (ICCV)
- 2020- European Conference on Computer Vision (ECCV)
- 2019- The International Conference on Acoustics, Speech, & Signal Processing (ICASSP)
- 2019- International Conference on Image Processing (ICIP)

Professional service

- 2024 European Conference on Computer Vision (ECCV). **Co-organizer of the Workshop: FOCUS: FOundation models Creators meet USers** Milan, Italy, Sept 30, 2024. Co-organized with: Antonio Alliegro (PoliTo), Francesca Pistilli (PoliTo), Songyou Peng (ETH Zurich), Biplab Banerjee (IIT Bombay), Gabriela Csurka (Naver Labs Europe). <https://focus-workshop.github.io/>
- 2024 27TH European Conference on Artificial Intelligence (ECAI). **Co-organizer of the Workshop: Adjustable Autonomy and Physical Embodied Intelligence (AAPEI)** Santiago de Compostela, 19-24 October 2024. Co-organized with: Fabio Patrizi (UniSapienza), Raffaello Camoriano (PoliTo), Francesca Pistilli (PoliTo), Carlo Masone (PoliTo), Marco Roveri (UniTrento), Luigi Palopoli (UniTrento). <https://sites.google.com/diag.uniroma1.it/aapei24/home-page?authuser=0>
- 2023 European Conference on Machine Learning and Principles and Practice of Knowledge Discovery in Databases (ECML-PKDD). **Co-organizer of the Workshop: Adapting to Change: Reliable Learning Across Domains.** Turin, Italy, Sept 18, 2023. Co-organized with: Raffaello Camoriano (PoliTo), Francesca Pistilli (PoliTo), Carlo Masone (PoliTo), Tatiana Tommasi (PoliTo). <https://sites.google.com/view/adapting-to-change-ecml-pkdd/>

Invited Talks

- Sept. 2025 Talk "Learning human skills from egocentric videos: a path for human-level humanoids" at Adjustable Autonomy and Physical Embodied Intelligence (AAPEI) at IEEE ECMR 2025 in Padova, Italy
- Sept. 2024 Talk "A backpack full of skills: Egocentric video understanding with diverse task perspective" at FAIR Conference 2024 in Naples, Italy
- Nov. 2023 Talk "Advancing Real-World Reasoning Beyond Classification" at Symposium on Continual Learning beyond Classification (SyCLEC) in Mainz, Germany
- April 2021 Talk "Point cloud denoising with graph convolutional neural networks" IEEE Student Branch Polito PitchD – The PhD's Pitch

Teaching

- 2025-: **Introduction to Graph Learning: from basic theory to advanced applications** , *PhD Computer engineering*, Politecnico di Torino.
- 2024-: **Robot Learning**, *M.Sc. Computer engineering*, Politecnico di Torino.
- 2024-: **Tecniche di Programmazione**, *B.Sc. Management Engineering*, Politecnico di Torino.
- 2021 : **Statistical Learning and Neural Networks**, *M.Sc. ICT for Smart Societies*, Politecnico di Torino.
- 2021 : **Multimedia Signal Processing**, *M.Sc. Computer Engineering*, Politecnico di Torino.
- 2021-2022: **Image and Video Processing**, *B.Sc. Cinema and Media Engineering*, Politecnico di Torino.

Computer skills

Python, PyTorch, Tensorflow
C, C++, R, Matlab, VHDL, ModelSim.

Languages

Italian: mother tongue
English: IELTS 7.0