

# Angelo Porrello

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**Summary.** Angelo Porrello has been a member of the **AImageLab** research group at the Department of Engineering “Enzo Ferrari”, University of Modena and Reggio Emilia, since 2018. He is currently a **Tenure-Track Assistant Professor (RTT)** at the Department of Engineering “Enzo Ferrari”, University of Modena and Reggio Emilia. He conducts internationally recognised research in artificial intelligence and computer vision. He has authored more than forty peer-reviewed scientific publications in leading international journals and conferences, including CVPR, ECCV, ICCV, NeurIPS and ICLR. His research focuses on advanced methods for **training and adapting neural networks**, with particular emphasis on continual learning, modular deep learning and federated learning. He also works on AI and computer-vision systems for anomaly detection and video analytics.

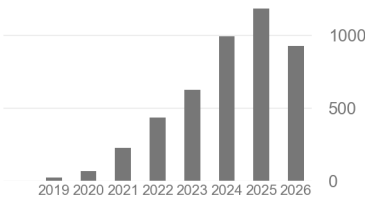
**Italian National Scientific Qualification.** He obtained the *Abilitazione Scientifica Nazionale* (ASN; Italian National Scientific Qualification) for Associate Professor in the academic recruitment fields **01/B1** (Computer Science) and **09/H1** (Information Processing Systems).

## GOOGLE SCHOLAR PROFILE

Metrics updated on 20 August 2026.

Cited by

|           | All  | Recent |
|-----------|------|--------|
| Citations | 4492 | 4392   |
| h-index   | 24   | 24     |
| i10-index | 31   | 30     |



## EDUCATION AND TRAINING

### PhD in Information and Communication Technologies (ICT)

Advisor: Simone Calderara

AImageLab, UNIMORE

2018 – 2021

- Awarded with honours by the *E4E – Engineering for Economics, Economics for Engineering* Doctoral School; research focus: deep learning and computer vision.
- Thesis: *Prior Knowledge Exploitation and Transfer in Deep Learning Architectures* [link]. The doctoral fellowship was funded by Farm4Trade.

## RESEARCH AREAS

### Primary areas

- Artificial Intelligence
- Machine Learning
- Deep Learning
- Computer Vision

### Specific research areas

- Continual Learning
- Modular Deep Learning
- Federated Learning
- Transfer Learning
- Model Regularisation
- Incremental Learning and Model Maintenance
- Object Detection
- Multi-Object Tracking
- Anomaly Detection
- Video Surveillance

## LANGUAGES

- **Italian:** Native.
- **English:** Advanced.

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|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------|
| <b>M.Sc. in Computer Engineering</b><br>Department of Engineering “Enzo Ferrari” (DIEF) – Final grade: 110/110 cum laude<br>– Thesis: <i>Moving Object Detection through Deep Denoising Auto-Encoders</i> . | UNIMORE<br>2015 – 2017 |
| <b>B.Sc. in Computer Science</b><br>Department of Physical, Computer and Mathematical Sciences<br>Final grade: 110/110 cum laude                                                                            | UNIMORE<br>2011 – 2015 |

## ACADEMIC EXPERIENCE

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|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------|
| <b>Tenure-Track Assistant Professor (RTT)</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               | AImageLab, UNIMORE<br>From 1 September 2026 |
| <b>Fixed-term Assistant Professor (RTD-A)</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               | AImageLab, UNIMORE<br>Until 31 August 2026  |
| <ul style="list-style-type: none"> <li>– <b>ECOSISTER (PNRR project, Spoke 4)</b>: “Pedestrian and cyclist safety, high-quality cycling network, modelling mobility flows, multimodal systems and shared mobility, cybernetic mobility, intelligent video system”.</li> <li>– <b>Activities</b>: within <b>Spoke 4</b> of the ECOSISTER project, research focused on the study, design and development of artificial-intelligence and computer-vision systems for smart-city applications, with particular emphasis on the perception and analysis of pedestrian traffic density in urban environments. The work focuses on multi-object tracking, person detection and tracking, trajectory prediction, and continual learning.</li> </ul> |                                             |
| <b>Postdoctoral Research Fellow</b><br>Advisor: Simone Calderara                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            | AImageLab, UNIMORE<br>2022                  |
| <ul style="list-style-type: none"> <li>– <b>Activities</b>: within the Horizon 2020 project <b>InSecTT</b> (<i>Intelligent Secure Trustable Things</i>), research, design and development of deep-learning techniques for detecting anomalous behaviours and events in public transport. The role also involved local coordination of development activities and preparation of technical and scientific documentation, including reports and presentations, for project reviews and reporting.</li> </ul>                                                                                                                                                                                                                                  |                                             |
| <b>PhD Researcher</b><br>Advisor: Simone Calderara                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          | AImageLab, UNIMORE<br>2019 – 2021           |
| <ul style="list-style-type: none"> <li>– <b>Research topics</b>: anomaly detection, continual learning, visual recognition and re-identification of people, animals and vehicles, neural-network analysis of satellite imagery, and self-supervised learning.</li> <li>– <b>Activities</b>: literature review; design and development of deep-learning models; preparation of scientific papers and management of the review and publication process; presentation of research results at international conferences; teaching support and supervision of Master’s theses.</li> </ul>                                                                                                                                                        |                                             |

## ACADEMIC TEACHING

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### Master’s Degree Courses.

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|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------|
| <b>Machine Learning and Deep Learning [IIM-55]</b><br>Master’s Degree Programme in Artificial Intelligence                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  | DIEF, UNIMORE<br>2023 – present |
| <ul style="list-style-type: none"> <li>– <b>Activities</b>: course lecturer; the course is taught in English. Teaching load: 33 hours in academic year 2023/24, 33 hours in academic year 2024/25 and 22 hours in academic year 2025/26.</li> <li>– <b>Previous teaching activities</b>: laboratory teaching support in 2018–2023.</li> <li>– <b>Course content</b>: theoretical and practical overview of supervised machine-learning techniques, including k-nearest neighbours, logistic regression and support-vector machines; unsupervised methods such as k-means; deep-learning foundations, including MLPs, CNNs and RNNs; and advanced machine-learning methodologies.</li> </ul> |                                 |

### Bachelor’s Degree Courses.

- Computer Science Fundamentals** [INF-002R] DIEF, UNIMORE  
Bachelor's Degree Programme in Computer Engineering 2025
- **Activities:** course lecturer, 27 teaching hours.
  - **Course content:** introduction to computer architecture and C programming, with particular emphasis on coding laboratories covering control structures, memory management, functions, basic data structures and debugging.
- Software Engineering** [INF-36] DIEF, UNIMORE  
Bachelor's Degree Programme in Computer Engineering 2025
- **Activities:** course lecturer, 11 teaching hours.
- Data Structures and Algorithms** [INF-29] DIEF, UNIMORE  
Bachelor's Degree Programme in Computer Engineering 2024
- **Activities:** course lecturer, 27 teaching hours.
- Fundamentals of Machine Learning** [INFMN-028] DIEF, UNIMORE  
Bachelor's Degree Programme in Computer Engineering 2022 – 2024
- **Activities:** course lecturer, 24 teaching hours in academic year 2022/23 and 27 hours in academic year 2023/24.
  - **Course content:** theoretical and practical overview of supervised machine-learning techniques, including k-nearest neighbours, logistic regression and support-vector machines, and unsupervised techniques such as k-means.

## Doctoral Courses and Advanced Training.

- Advanced Training Strategies for Incremental and Decentralised Learning** Universidad de Granada  
International advanced training course [link] 16 June 2025
- **Activities:** 10 hours of teaching in an international specialist course on advanced strategies for incremental and decentralised learning, organised by Cátedra ENIA IAFER, DaSCI Institute.
- Advanced AI Approaches to Digital Humanities** University of Trento  
Doctoral course [link] 2023
- **Activities:** 10 hours of teaching within the “PhD School in Information Engineering and Computer Science”.

## University Master's Programme.

- ADBoT: Autonomous Driving and enaBling Technologies** University of Trento  
University Master's programme [link] 2019
- **Activities:** 8 hours of teaching, in collaboration with UNIMORE.

## TECHNOLOGY TRANSFER, INDUSTRY COLLABORATION AND PATENTS

- Scientific Project Lead** Department of Engineering “Enzo Ferrari”  
Collaboration with Data Reply S.r.l. (2025, 6 months)
- Scientific lead for the project “*Apprendimento online e Lifelong Learning in sistemi di AI*” (Online and Lifelong Learning in AI Systems).
  - **Activities:** development of an open-source Python library for designing and benchmarking continual-learning algorithms in artificial intelligence.
- Scientific Project Lead** AIRI Research Centre  
Collaboration with SEW-EURODRIVE S.a.s. (2025, 12 months)

- Scientific coordinator of the project “*SSL neural network definition for Condition Based Monitoring to be applied on different machines type within a classic packaging line*”.
- **Activities:** design and development of an unsupervised *anomaly detection* system for predictive maintenance of industrial gearmotors.

## Technical Project Lead

Department of Engineering “Enzo Ferrari”  
Collaboration with ENI S.p.A. (2025, 18 months)

- **Activities:** research, development and technical support in intelligent vision and multimodal artificial intelligence. Design and development of a computer-vision-based monitoring system for the automatic analysis of salient actions, incorporating multi-person detection and tracking, open-vocabulary action recognition and multimodal information extracted from documents.

## Patent for an industrial invention [link]

Inventor  
Italian Ministry of Economic Development (2019)

- Inventor of a patent for analysing images of animal carcasses using artificial-intelligence techniques based on convolutional neural networks (CNNs), developed in collaboration with Farm4Trade.
- Official title: “*Metodo di valutazione di uno stato di salute di un elemento anatomico, relativo dispositivo di valutazione e relativo sistema di valutazione*” (Method, device and system for assessing the health status of an anatomical element).

## Organisation and Public Engagement

Research Night [link]

AImageLab  
UNIMORE (2024–2025)

- Organiser of the AImageLab stand at Research Night in 2024 and 2025, a public science-outreach event featuring interactive demonstrations, posters and presentations on the laboratory’s main research themes.

## Training for Companies, Competence Centres and Institutions

Since 2018, more than **200 hours** of training delivered to company personnel.

- *Master in Machine Learning and Deep Learning* (Fondazione Democenter): 6 editions (2018–2024), 16 hours each.
- *Python, Deep Learning and Computer Vision* (UNIMORE): 24 hours (2025 edition).
- *Machine Learning and Deep Learning – Training and Know-how Transfer* (Academy UNIPOL): 1 edition (2025), 12 hours.
- *Machine Learning and Deep Learning Course* (BI-REX for SACMI): 1 edition (2025), 12 hours.
- *Theoretical and Practical Course in Machine Learning and Deep Learning – Master Teknè* (BI-REX): 3 editions (2022, 2024, 2025), 8 hours each.
- *Intensive Mater AI and ML for Smart Factory* (Experis S.r.l.): 1 edition (2023–2024), 12 hours.
- *Theoretical and Practical Training Course in Computer Vision and Machine Learning* (CNH Industrial Italia S.p.A.): 1 edition (2023), 8 hours.
- *School in AI: Deep Learning, Vision and Language for Industry* (AI Academy UNIMORE): 2 editions (2022), 4 hours each.
- *Predictive Analytics and Machine Learning* (IMA S.p.A. Unipersonale): 1 edition (2022), 6 hours.
- *Training Course on Artificial Intelligence* (Istituto Zooprofilattico Sperimentale dell’Abruzzo e del Molise “G. Caporale”, Italian Experimental Institute for Animal Health): 1 edition (2018), 8 hours.

## NATIONAL RESEARCH PROJECTS

### ECOSISTER

Emilia-Romagna Territorial Innovation Ecosystem [link]

AImageLab, UNIMORE  
2023 – present

- **Activities:** participation in the research activities of Spoke 4, focusing on artificial-intelligence and computer-vision systems for smart-city applications, intelligent mobility and pedestrian-flow analysis.

- **Funding:** project under the Italian National Recovery and Resilience Plan (PNRR), funded by the European Union – *NextGenerationEU*, through the Italian Ministry of University and Research (MUR).

## LEGO.AI

AImageLab, UNIMORE

LEarning the Geometry of knOwledge in AI systems [link]

2022 – 2025

- **Activities:** research and development of geometric deep-learning models, with particular emphasis on geometric constraints and regularisers for continual learning, few-shot learning and domain adaptation. Design of models with stronger generalisation capabilities and reduced annotated-data requirements.
- **Funding:** PRIN (Research Projects of National Interest) project, funded by the Italian Ministry of Education, University and Research (MIUR).

## AI 4 Vector

AImageLab, UNIMORE

Artificial Intelligence and Remote Sensing

2019 – 2021

- **Activities:** development of predictive models for monitoring and forecasting the proliferation of insect vectors of infectious diseases, using convolutional neural networks to analyse climate and environmental variables derived from high-resolution multi-band satellite imagery.
- **Funding:** Italian Ministry of Health, under the research project “*Artificial Intelligence and Remote Sensing: innovative methods for monitoring the vectors and the associated ecological/environmental variables*”.

## UBINVB

AImageLab, UNIMORE

Ubiquitous objective measures of intergroup nonverbal behaviors

2018

- **Activities:** automatic analysis of human behaviour and identification of emerging psychological constructs in dyadic interactions using *Graph Neural Networks*, including the design and development of graph-based neural models for structured and relational data.
- **Funding:** *La Città Educante* project, Cluster Tecnologico Nazionale Smart Communities Tech, co-funded by MIUR.

# INTERNATIONAL RESEARCH PROJECTS

## NexTArc

AImageLab, UNIMORE

Next Generation Open Innovations in

Trustworthy Embedded AI Architectures [link]

09/2025 – present

- **Activities:** research and development of modular deep-learning techniques for smart-city applications and public-transport traffic monitoring, including occupancy-density estimation and monitoring systems and onboard seat-availability mapping. The work follows privacy-preserving and trustworthy-AI principles to ensure model security and robustness.
- **Funding:** Horizon Europe project funded by the European Commission, Grant Agreement No. 101194287.

## STORE

AImageLab, UNIMORE

Shared daTabase for Optronic Image

Recognition and Evaluation [link]

12/2023 – present

- **Activities:** research and development of learning systems for *object detection*, focusing on incremental model adaptation and *decentralised learning* for training and updating visual-recognition systems in the defence sector.
- **Funding:** European Commission project under the *European Defence Fund (EDF)*, Grant Agreement No. EDF-2022-101121405.

## InSecTT

AImageLab, UNIMORE

Intelligent Secure Trustable Things [link]

2021 – 2022

- **Activities:** automatic analysis of human behaviour in public transport to detect anomalous behaviours, through the development of deep-learning and computer-vision models.
- **Funding:** Horizon 2020 project – Electronic Component Systems for European Leadership Joint Undertaking (ECSEL JU), Grant Agreement No. 876038.

- **Activities:** development of predictive models based on *Convolutional Neural Networks* to monitor the spread of West Nile virus by analysing climate and environmental variables derived from high-resolution multi-band satellite imagery.
- **Funding:** European Space Agency (ESA), call “*EO Science for Society – Permanently Open Call for Proposals EOEP-5 Block 4*”.

## RESEARCH GRANTS AS PRINCIPAL INVESTIGATOR

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### Update AI Models Like Software: Model Re-basin Without Data or Retraining

Departmental FAR Project – Department of Engineering “Enzo Ferrari”, UNIMORE

2025

- **Activities:** development of techniques for updating and reconfiguring artificial-intelligence models without access to the original data or full retraining, inspired by software maintenance and versioning paradigms.
- **Funding:** Departmental FAR Project of the Department of Engineering “Enzo Ferrari”, University of Modena and Reggio Emilia. Duration: 12 months; total budget: EUR 13,203.

### Forget Me Not: Bio-Inspired AI Models for Continual and Sustainable Learning

Departmental FAR Project – Department of Engineering “Enzo Ferrari”, UNIMORE

2023

- **Activities:** study and development of artificial-intelligence models inspired by biological mechanisms for continual and sustainable learning, with particular attention to catastrophic forgetting.
- **Funding:** Departmental FAR Project of the Department of Engineering “Enzo Ferrari”, University of Modena and Reggio Emilia; total budget: EUR 10,000.

## AWARDS AND HONOURS

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### Honorable Mention

International Conference on Image Analysis and Processing (ICIAP), Rome

2025

- The paper “*How to Train Your Metamorphic Deep Neural Network*” (T. Sommariva, S. Calderara, A. Porrello) received an **Honorable Mention** for its scientific contribution and originality.

### Spotlight Paper

International Conference on Learning Representations (ICLR), Singapore [link]

2025

- The paper “*A Second-Order Perspective on Model Compositionality and Incremental Learning*” (A. Porrello, L. Bonicelli, P. Buzzega, M. Millunzi, S. Calderara, R. Cucchiara) was selected as a **Spotlight Paper**.

### Best PhD Thesis Award

Department of Engineering “Enzo Ferrari”, University of Modena and Reggio Emilia

2022

- Award conferred by the Department’s Scientific Committee for the best thesis in the International Doctoral Programme in *Information and Communication Technologies (ICT)*, 34th cycle, in recognition of the completeness, originality and scientific relevance of the work.

## INVITED TALKS AND ORAL PRESENTATIONS

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### Oral Presentation

International Conference on Image Analysis and Processing (ICIAP 2025) [link]

2025

- Presentation of the **Honorable Mention** paper “*How to Train Your Metamorphic Deep Neural Network*” at the International Conference on Image Analysis and Processing (ICIAP 2025), Rome, Italy.

### Keynote Speaker

University of Teramo (UniTe) [link]

2024

- Keynote speaker at the *PhD Annual Meeting of Veterinary Medical Sciences, Public Health and Animal Welfare – Artificial Intelligence Applied to Biomedical Science*, organised as part of UniTe Research Month. Held on 18 September 2024 at the Thesis Hall, Polo S. Spaventa, Teramo, Italy.

### Invited Speaker

TEC Eurolab – BlueTensor, Campogalliano (MO) [link]

2024

- Invited talk at “*Perché implementare l’AI nel controllo qualità?*” (Why Implement AI in Quality Control?), held on 10 July 2024 at TEC Eurolab. Academic and research representative on the panel “*AI nel Controllo Qualità: applicazioni industriali ed evoluzioni scientifiche*”, focusing on AI applications in industrial processes and quality control.

### Invited Speaker

PNRR ECOSISTER Project, Parma / Rimini

2024–2025

- Presentation of research activities related to the PNRR *ECOSISTER* project at the Conference Hall, Aule delle Scienze, University of Parma (June 2024 and June 2025), and at the *ECOMONDO* trade fair in Rimini (November 2025).

### Oral Presentation

International Conference on Image Analysis and Processing (ICIAP 2019) [link]

2019

- Invited speaker at the 20th International Conference on Image Analysis and Processing (ICIAP 2019), Trento, Italy, presenting the paper “*Latent Space Autoregression for Novelty Detection*”.

### Invited Speaker

Tetra Pak, Modena

2022

- Invited presentation on artificial-intelligence research at Tetra Pak’s Modena premises (September 2022).

## RESEARCH COLLABORATIONS AND PROFESSIONAL AFFILIATIONS

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### AFFILIATIONS

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#### AImageLab – Artificial Intelligence and Machine Learning Laboratory

Department of Engineering “Enzo Ferrari”, UNIMORE [link]

2018 – present

- Member of the AImageLab research group, conducting ongoing research in artificial intelligence, machine learning and computer vision.

#### European Laboratory for Learning and Intelligent Systems (ELLIS)

European network of excellence in artificial intelligence and machine learning [link]

2025 – present

- ELLIS member; evaluated candidate profiles for the ELLIS PhD Programme in 2022.

#### Artificial Intelligence Research and Innovation Center (AIRI)

University of Modena and Reggio Emilia [link]

2025 – present

- AIRI affiliate for research, technology transfer and interdisciplinary collaboration in artificial intelligence.

#### Computer Vision Foundation (CVF)

International foundation for computer vision

2020 – present

- Member of the Computer Vision Foundation, which promotes and coordinates leading conferences in computer vision.

#### Italian Association for Computer Vision, Pattern Recognition and Machine Learning

CVPL – Italian scientific community

2020 – present

- Member of the CVPL association, participating in scientific-community and networking activities at the national level.

## INTERNATIONAL COLLABORATIONS

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- Felix Dangel – Vector Institute, Canada** 2025 – present
- **Activities:** collaboration on curvature-aware regularisation methods based on Hessian approximation.
  - **Joint publications:** *Dataless Weight Disentanglement in Task Arithmetic...* [7] (ICLR 2026).
- Marco Ciccone – Vector Institute, Canada** 2025 – present
- **Activities:** collaboration on neural-network model re-basin and the geometry of weight spaces.
  - **Joint publications:** *Gradient-Sign Masking for Task Vector Transport...* [8] (ICLR 2026).
- Joost van de Weijer – Computer Vision Center (CVC), Barcelona** 2025 – present
- **Activities:** collaboration on advanced model-merging and task-arithmetic techniques.
  - **Joint publications:** *Accurate and Efficient Low-Rank Model Merging...* (NeurIPS 2025) [12].
- Jorge Calvo-Zaragoza – University of Alicante, Spain** 2025 – present
- **Activities:** collaboration on task arithmetic for out-of-domain handwritten text recognition (HTR).
  - **Joint publications:** *Zero-Shot Synthetic-to-Real Handwritten Text...* (under submission).
- P. N. Kolm (NYU, USA) & Jacopo Credi (Axyon AI)** 2022 – present
- **Activities:** collaboration on continual-training pipelines with noisy data.
  - **Joint publications:** *A Second-Order Perspective on Model Compositionality...* (ICLR 2025) [13]; *May the Forgetting Be with You: Alternate Replay...* (BMVC 2024) [26].

## NATIONAL COLLABORATIONS

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- Andrew D. Bagdanov – University of Florence** 2025 – present
- **Activities:** collaboration on neural-model composition and merging.
  - **Joint publications:** *Accurate and Efficient Low-Rank Model Merging...* (NeurIPS 2025) [12].
- Lamberto Ballan – University of Padua** 2022 – present
- **Activities:** collaboration on trajectory prediction for smart-city applications.
  - **Joint publications:** *How Many Observations Are Enough? Knowledge...* (CVPR 2022) [4].
- Emanuele Rodolà – Sapienza University of Rome** 2022 – present
- **Activities:** collaboration on geometry-inspired approaches to model re-basin.
  - **Joint publications:** *Update Your Transformer to the Latest Release...* (ICML 2025) [14].
- Concetto Spampinato – University of Catania** 2022 – present
- **Activities:** collaboration on biologically inspired methods for continual learning.
  - **Joint publications:** *Transfer Without Forgetting* (ECCV 2022) [3]; *On the Effectiveness of Lipschitz-Driven...* (NeurIPS 2022) [19]; *Saliency-Driven Experience Replay for Continual...* (NeurIPS 2025) [15].
- Giuseppe Marruchella – University of Teramo (UniTe)** 2022 – present
- **Activities:** analysis and segmentation of veterinary images.
  - **Joint publications:** *Scoring Pleurisy in Slaughtered Pigs Using CNNs* (Veterinary Research) [38]; *Scoring Enzootic Pneumonia-Like Lesions* (Pathogens) [34].
- Mauro Dell’Amico – UNIMORE** 2022 – present
- **Activities:** neural models for operations research problems.
  - **Joint publications:** *Self-Labeling the Job Shop Scheduling Problem* (NeurIPS 2025) [16].

**Francesco Pistolesi – University of Pisa**

2025 – present

- **Activities:** collaboration on privacy-preserving pose estimation.
- **Joint publications:** *Privacy-Preserving Human Pose Estimation: A Survey, Taxonomy, and...* (under submission).

**Jacopo Bonato – Leonardo Labs**

2024

- **Activities:** collaboration on continual learning for action recognition.
- **Joint publications:** *Mask and Compress: Efficient Skeleton-Based Action...* (ICPR 2024) [42].

**Annamaria Conte – IZS Teramo**

2018 – 2023

- **Activities:** analysis of georeferenced health data and epidemiological models.
- **Joint publications:** *Spotting Insects from Satellites* (ICPR 2019) [48]; *The Color Out of Space* (ICPR 2021) [47]; *Predicting WNV Circulation in Italy* (Remote Sensing) [37]; *Spotting Virus from Satellites* (IEEE TGRS) [32]; *Spotting Culex pipiens from Satellite* (Frontiers in Veterinary Science) [31].

**Andrea Capobianco Dondona – Farm4Trade**

2018 – 2021

- **Activities:** collaboration on animal re-identification systems.
- **Joint publications:** *Multi-Views Embedding for Cattle Re-Identification* (SITIS 2018) [49].

## STUDENT SUPERVISION AND RESEARCH MENTORING

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### PHD SUPERVISION

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**PhD Supervisor – Thomas Sommariva**

2025 – present

PhD in Information and Communication Technology (ICT), UNIMORE

- **Thesis:** *Advancing Generative Artificial Intelligence Systems by Integrating Modularity, Efficiency, and Compositionality.*
- **Role:** official supervisor.

**PhD Co-supervisor – Riccardo Santi**

2024 – present

PhD in Information and Communication Technology (ICT), UNIMORE

- **Thesis:** *Federated and Continual Learning for Privacy-Oriented Efficient Learning Systems with Applications in Industry and Healthcare.*

**PhD Co-supervision and Research Mentoring**

2022 – present

Ongoing scientific support

- Unofficial co-advising of doctoral students and early-career researchers: Riccardo Benaglia, Mattia Bernardi, Gianpaolo Bontempo, Lorenzo Bonicelli, Matteo Boschini, Pietro Buzzega, Giacomo Capitani, Gianluca Mancusi, Monica Millunzi, Francesca Morandi, Aniello Panariello, Filippo Rinaldi, Riccardo Salami and Giacomo Salici.

### MASTER'S THESES – COMPUTER ENGINEERING / ARTIFICIAL INTELLIGENCE (UNIMORE)

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**Continual Learning via Logits Distillation**

2019

*Thesis by Pietro Buzzega [link].***Evaluation of Continual Learning Approaches to Mitigate Mode Collapse in Generative Adversarial Networks**

2021

*Thesis by Lorenzo Schioli [link].***Anomalous Activity Detection in Public Transport**

2021

*Thesis by Aniello Panariello [link].***Evaluation of Catastrophic Forgetting in Unsupervised Learning**

2022

*Thesis by Vipul Kumar [link].*

**Analysis of Transformer Encoders for Knowledge Distillation in Person Re-Identification** 2023

*Thesis by Alessandro Castellucci [link].*

**Continual Zero-Shot Satellite Image Classification** 2023

*Thesis by Federica Santarcangelo [link].*

**Towards Efficient and Incremental Training of Deep Vision Transformers** 2024

*Thesis by Lorenzo Calvano [link].*

**How to Train Your Metamorphic Deep Neural Network** 2025

*Thesis by Thomas Sommariva.*

**Synthetic-to-Real Domain Gap in Multiple Object Tracking** 2025

*Thesis by Francesca Morandi.*

**Training-Free Domain Adaptation through Task Analogies** ongoing

*Student: Fabio Bozzoli.*

## BACHELOR'S THESES – COMPUTER ENGINEERING (UNIMORE)

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**CLIP and FLIP: An Overview and an Analysis of Bias** 2024

*Thesis by Beatrice Calderara.*

## PEER REVIEW AND EDITORIAL ACTIVITIES

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### Guest Editor

Special issue in an international Q1 journal according to the SCImago 2023 ranking [link] 2022

- **Activities:** Guest Editor of the *Pathogens* special issue “Artificial Intelligence (AI) as One Health Tool in Pathology to Monitor and Control Infectious Diseases”.

### PhD Thesis Examiner

2025 – present

Italian and international doctoral programmes

- Tomaso Trinci (2025), University of Florence.
- Federico Girella (2026), University of Verona.
- Amelia Sorrenti (2026), National PhD Programme in Artificial Intelligence.

### Postdoctoral Fellowship Proposal Reviewer

Research Foundation Flanders (FWO) – European Science Foundation 2025

- **Activities:** external expert evaluation of a postdoctoral fellowship proposal under the *Junior and Senior Postdoctoral Fellowship 2024* call of the Research Foundation Flanders (FWO), through an independent review process managed by the European Science Foundation (ESF).
- **Proposal reviewed:** “*Making Continual Learning Ready for the Dynamic Real-world: Long-term Unsupervised Continual Representation Learning*” (Ref. 24-FWO-PDOC-1509).

### Peer Reviewer

2019 – present

Top-tier international conferences in AI, ML and Computer Vision

- **Activities:** reviewing for leading international conferences in computer vision, machine learning and artificial intelligence, including CVPR, ICCV, ECCV, NeurIPS, IJCAI and ICPR.

## ORGANISATION OF INTERNATIONAL WORKSHOPS

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**Breaking the Monolith: 1st Workshop on Advances in Modular Deep Learning** Rome, Italy  
International workshop co-located with ICIAP 2025 – [link] 2025

- **Activities:** organisation of the first ICIAP international workshop dedicated to recent advances in modular deep learning, with particular emphasis on composable, scalable and adaptive models.

**PILM '25: Personalized Incremental Learning in Medicine** Dublin, Ireland  
International workshop co-located with ACM Multimedia 2025 – [link] 2025

- **Activities:** organisation of an international workshop on incremental and personalised learning techniques in medicine, focusing on model robustness, adaptation and reliability.

**AI per la Finanza ed il Commercio (AI for Finance and Commerce)** Pisa, Italy  
Italian workshop co-located with ITAL-IA 2023 – [link] 2023

- **Activities:** co-organisation of a national workshop on the application of artificial-intelligence and machine-learning techniques in finance, commerce and marketing.

**Novel Benchmarks and Approaches for Real-World Continual Learning** Lecce, Italy  
International workshop co-located with ICIAP 2022 – [link] 2022

- **Activities:** co-organisation of an international workshop on new benchmarks and methods for continual learning in real-world scenarios, focusing on evaluation, generalisation and incremental learning.

## SCIENTIFIC DISSEMINATION AND TRAINING

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**Participation in International Conferences** 2018 – present  
Poster presentations

- **Activities:** poster presentations at leading international conferences, including *ICLR 2025* (Singapore), *ECCV 2024* (Milan, Italy), *ICCV 2023* (Paris, France), *ECCV 2022* (Tel Aviv, Israel), *CVPR 2022* (New Orleans, USA), *ECCV 2020* (online), *AISTATS 2019* (Naha, Okinawa, Japan) and *SITIS 2018* (Las Palmas de Gran Canaria, Spain).

**International Schools**  
Student 2018

- **Activities:** participation in *VISMAL 2018 – Summer School on Machine and Vision Intelligence*, organised by the International Association for Pattern Recognition (IAPR), Vico Equense, Italy.

## OTHER ACTIVITIES

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- Contributed to the organisation of the sixth *IWCW – International Workshop on Computer Vision*, held in Modena in May 2018.
- Member of a university working group involved in developing the new University Museums at AGO Modena, led by Gianluca Carnevale.
- Member of the admissions committee for the Master's Degree Programme in *Artificial Intelligence*, evaluating non-EU applicants and determining the international admissions quota.
- Member of the Academic Board of the PhD Programme in *Information and Communication Technology (ICT)*.
- Member of the Organisation and Monitoring Committee (O&M) of the *ICT – International PhD Programme in Information and Communication Technology* at the Department of Engineering “Enzo Ferrari”, UNIMORE.

- Member of the organising board of *ICIAP 2027* in Modena, serving as **Tutorial Chair**.

## TOP-TIER INTERNATIONAL CONFERENCES IN COMPUTER VISION (CVPR, ICCV, ECCV) – RANK A\* CORE23

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- [1] G. Mancusi, A. Panariello, **A. Porrello**, M. Fabbri, S. Calderara, and R. Cucchiara, “Trackflow: Multi-object tracking with normalizing flows”, in *IEEE International Conference on Computer Vision*, IEEE, 2024.
- [2] M. Menabue, E. Frascaroli, M. Boschini, E. Sangineto, L. Bonicelli, **A. Porrello**, and S. Calderara, “Semantic residual prompts for continual learning”, *Proceedings of the European Conference on Computer Vision*, 2024.
- [3] M. Boschini, L. Bonicelli, **A. Porrello**, G. Bellitto, M. Pennisi, S. Palazzo, C. Spampinato, and S. Calderara, “Transfer without Forgetting”, in *Proceedings of the European Conference on Computer Vision*, 2022.
- [4] A. Monti, **A. Porrello**, S. Calderara, P. Coscia, L. Ballan, and R. Cucchiara, “How many Observations are Enough? Knowledge Distillation for Trajectory Forecasting”, in *Proceedings of the IEEE conference on Computer Vision and Pattern Recognition*, 2022.
- [5] **A. Porrello**, L. Bergamini, and S. Calderara, “Robust re-identification by multiple views knowledge distillation”, in *Proceedings of the European Conference on Computer Vision*, Springer, 2020.
- [6] D. Abati, **A. Porrello**, S. Calderara, and R. Cucchiara, “Latent space autoregression for novelty detection”, in *Proceedings of the IEEE conference on Computer Vision and Pattern Recognition*, 2019.

## TOP-TIER INTERNATIONAL CONFERENCES IN MACHINE LEARNING AND ARTIFICIAL INTELLIGENCE (NEURIPS, ICLR, ICML) – RANK A\* CORE23

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- [7] **A. Porrello**, P. Buzzega, F. Dangel, T. Sommariva, R. Salami, L. Bonicelli, and S. Calderara, “Dataless weight disentanglement in task arithmetic via kronecker-factored approximate curvature”, in *International Conference on Learning Representations*, 2026.
- [8] F. Rinaldi, A. Panariello, G. Salici, F. Liu, M. Ciccone, **A. Porrello**, and S. Calderara, “Gradient-sign masking for task vector transport across pre-trained models”, in *International Conference on Learning Representations*, 2026.
- [9] F. Rinaldi, A. Panariello, G. Salici, **A. Porrello**, and S. Calderara, “Transporting task vectors across different architectures without training”, in *International Conference on Machine Learning*, 2026.
- [10] T. Sommariva, F. Morandi, S. Calderara, and **A. Porrello**, “Distilling linearized behavior into non-linear fine-tuning for effective task arithmetic”, in *International Conference on Machine Learning*, 2026.
- [11] C. Cappellino, G. Mancusi, M. Mosconi, **A. Porrello**, S. Calderara, and R. Cucchiara, “Dithub: A modular framework for incremental open-vocabulary object detection”, *Advances in Neural Information Processing Systems*, 2025.
- [12] A. Panariello, D. Marczak, S. Magistri, **A. Porrello**, B. Twardowski, A. D. Bagdanov, S. Calderara, and J. van de Weijer, “Accurate and efficient low-rank model merging in core space”, in *Advances in Neural Information Processing Systems*, 2025.
- [13] **A. Porrello**, L. Bonicelli, P. Buzzega, M. Millunzi, S. Calderara, and R. Cucchiara, “A second-order perspective on model compositionality and incremental learning”, in *International Conference on Learning Representations*, 2025.

- [14] F. Rinaldi, G. Capitani, L. Bonicelli, D. Crisostomi, F. Bolelli, E. Ficarra, E. Rodola, S. Calderara, and **A. Porrello**, “Update your transformer to the latest release: Re-basin of task vectors”, in *International Conference on Machine Learning*, 2025.
- [15] G. Bellitto, F. P. Salanitri, M. Pennisi, M. Boschini, L. Bonicelli, **A. Porrello**, S. Calderara, S. Palazzo, C. Spampinato, *et al.*, “Saliency-driven experience replay for continual learning”, in *Advances in Neural Information Processing Systems*, 2024.
- [16] A. Corsini, **A. Porrello**, S. Calderara, and M. Dell’Amico, “Self-labeling the job shop scheduling problem”, in *Advances in Neural Information Processing Systems*, 2024.
- [17] G. Mancusi, M. Bernardi, A. Panariello, **A. Porrello**, R. Cucchiara, and S. Calderara, “Is multiple object tracking a matter of specialization?”, in *Advances in Neural Information Processing Systems*, 2024.
- [18] M. Ning, E. Sangineto, **A. Porrello**, S. Calderara, and R. Cucchiara, “Input perturbation reduces exposure bias in diffusion models”, in *International Conference on Machine Learning*, PMLR, 2023.
- [19] L. Bonicelli, M. Boschini, **A. Porrello**, C. Spampinato, and S. Calderara, “On the Effectiveness of Lipschitz-Driven Rehearsal in Continual Learning”, in *Advances in Neural Information Processing Systems*, 2022.
- [20] P. Buzzega, M. Boschini, **A. Porrello**, D. Abati, and S. Calderara, “Dark Experience for General Continual Learning: a Strong, Simple Baseline”, in *Advances in Neural Information Processing Systems*, 2020.

## OTHER MAJOR INTERNATIONAL CONFERENCES – RANK A CORE23

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- [21] G. Capitani, L. Bonicelli, **A. Porrello**, F. Bolelli, S. Calderara, E. Ficarra, *et al.*, “Towards unbiased continual learning: Avoiding forgetting in the presence of spurious correlations”, in *Proceedings of the IEEE Winter conference on Applications of Computer Vision*, 2025.
- [22] L. Lumetti, G. Capitani, E. Ficarra, S. Calderara, C. Grana, **A. Porrello**, and F. Bolelli, “U-net transplant: The role of pre-training for model merging in 3d medical segmentation”, in *International Conference on Medical Image Computing and Computer-Assisted Intervention*, Springer, 2025.
- [23] A. Panariello, E. Frascaroli, P. Buzzega, L. Bonicelli, **A. Porrello**, and S. Calderara, “Modular embedding recomposition for incremental learning”, in *British Machine Vision Conference*, 2025.
- [24] G. Capitani, F. Bolelli, **A. Porrello**, S. Calderara, and E. Ficarra, “Clusterfix: A cluster-based debiasing approach without protected-group supervision”, in *Proceedings of the IEEE Winter conference on Applications of Computer Vision*, 2024.
- [25] E. Frascaroli, A. Panariello, P. Buzzega, L. Bonicelli, **A. Porrello**, and S. Calderara, “Clip with generative latent replay: A strong baseline for incremental learning”, in *British Machine Vision Conference*, 2024.
- [26] M. Millunzi, L. Bonicelli, **A. Porrello**, J. Credi, P. N. Kolm, and S. Calderara, “May the forgetting be with you: Alternate replay for learning with noisy labels”, in *British Machine Vision Conference*, 2024.
- [27] G. Bontempo, **A. Porrello**, F. Bolelli, S. Calderara, and E. Ficarra, “Das-mil: Distilling across scales for mil classification of histological wsis”, in *International Conference on Medical Image Computing and Computer-Assisted Intervention*, Springer, 2023, pp. 248–258.
- [28] **A. Porrello**, D. Abati, S. Calderara, and R. Cucchiara, “Classifying signals on irregular domains via convolutional cluster pooling”, in *International Conference on Artificial Intelligence and Statistics*, PMLR, 2019.

- [29] M. Millunzi, L. Bonicelli, **A. Porrello**, J. Credi, P. N. Kolm, and S. Calderara, “Earl: Embracing amnesic replay for learning with noisy labels”, *Pattern Recognition*, 2026.
- [30] A. Panariello, G. Mancusi, F. H. Ali, **A. Porrello**, S. Calderara, and R. Cucchiara, “Monocular per-object distance estimation with masked object modeling”, *Computer Vision and Image Understanding*, 2025.
- [31] C. Ippoliti, L. Bonicelli, M. De Ascentis, S. Tora, A. Di Lorenzo, S. G. d’Alessio, **A. Porrello**, A. Bonanni, D. Cioci, M. Goffredo, *et al.*, “Spotting culex pipiens from satellite: Modeling habitat suitability in central Italy using sentinel-2 and deep learning techniques”, *Frontiers in Veterinary Science*, 2024.
- [32] L. Bonicelli, **A. Porrello**, S. Vincenzi, C. Ippoliti, F. Iapaolo, A. Conte, and S. Calderara, “Spotting virus from satellites: Modeling the circulation of West Nile virus through graph neural networks”, *IEEE Transactions on Geoscience and Remote Sensing*, 2023.
- [33] G. Bontempo, F. Bolelli, **A. Porrello**, S. Calderara, and E. Ficarra, “A graph-based multi-scale approach with knowledge distillation for WSI classification”, *IEEE Transactions on Medical Imaging*, 2023.
- [34] J. Hattab, **A. Porrello**, A. Romano, A. Rosamilia, S. Ghidini, N. Bernabò, A. Capobianco Dondona, A. Corradi, and G. Marruchella, “Scoring enzootic pneumonia-like lesions in slaughtered pigs: Traditional vs. artificial-intelligence-based methods”, *Pathogens*, 2023.
- [35] M. Boschini, L. Bonicelli, P. Buzzega, **A. Porrello**, and S. Calderara, “Class-Incremental Continual Learning into the eXtended DER-verse”, *IEEE Transactions on Pattern Analysis and Machine Intelligence*, 2022.
- [36] M. Boschini, P. Buzzega, L. Bonicelli, **A. Porrello**, and S. Calderara, “Continual semi-supervised learning through contrastive interpolation consistency”, *Pattern Recognition Letters*, 2022.
- [37] L. Candeloro, C. Ippoliti, F. Iapaolo, F. Monaco, D. Morelli, R. Cuccu, P. Fronte, S. Calderara, S. Vincenzi, **A. Porrello**, *et al.*, “Predicting WNV circulation in Italy using Earth Observation data and extreme gradient boosting model”, *Remote Sensing*, 2020.
- [38] A. R. Trachtman, L. Bergamini, A. Palazzi, **A. Porrello**, A. C. Dondona, E. Del Negro, A. Paolini, G. Vignola, S. Calderara, and G. Marruchella, “Scoring pleurisy in slaughtered pigs using convolutional neural networks”, *Veterinary research*, 2020.

## OTHER VENUES (ICPR, ICIAP, ETC.)

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- [39] F. Morandi, O. Moussadek, F. Venturini, M. Suardi, A. Banzatti, F. Cannarile, **A. Porrello**, and S. Calderara, “Robust zero-shot generalization for open-vocabulary action recognition via task arithmetic”, in *Proceedings of the 22nd International Conference on Advanced Visual and Signal-Based Systems (AVSS)*, 2026.
- [40] G. Salici, S. Köhler, A. Fiorina, F. Zannella, **A. Porrello**, S. Calderara, *et al.*, “Segment-wise anomaly detection via compression tokens in industrial production lines”, in *Proceedings of CINI National Conference on Artificial Intelligence (Ital-IA)*, 2026.
- [41] R. Benaglia, **A. Porrello**, P. Buzzega, S. Calderara, and R. Cucchiara, “Trajectory forecasting through low-rank adaptation of discrete latent codes”, in *International Conference on Pattern Recognition*, 2025.
- [42] M. Mosconi, A. Sorokin, A. Panariello, **A. Porrello**, J. Bonato, M. Cotogni, L. Sabetta, S. Calderara, and R. Cucchiara, “Mask and compress: Efficient skeleton-based action recognition in continual learning”, in *International Conference on Pattern Recognition*, 2025.

- [43] T. Sommariva, S. Calderara, and **A. Porrello**, “How to train your metamorphic deep neural network”, in *International Conference on Image Analysis and Processing*, Springer, 2025.
- [44] M. Menabue, E. Frascaroli, M. Boschini, L. Bonicelli, **A. Porrello**, S. Calderara, *et al.*, “An attention-based representation distillation baseline for multi-label continual learning”, in *International Conference on Machine Learning, Optimization, and Data Science*, 2024.
- [45] G. Bontempo, L. Lumetti, **A. Porrello**, F. Bolelli, S. Calderara, and E. Ficarra, “Buffer-mil: Robust multi-instance learning with a buffer-based approach”, in *International Conference on Image Analysis and Processing*, 2023.
- [46] P. Buzzega, M. Boschini, **A. Porrello**, and S. Calderara, “Rethinking Experience Replay: a Bag of Tricks for Continual Learning”, in *International Conference on Pattern Recognition*, IEEE, 2021.
- [47] S. Vincenzi, **A. Porrello**, P. Buzzega, M. Cipriano, P. Fronte, R. Cuccu, C. Ippoliti, A. Conte, and S. Calderara, “The color out of space: learning self-supervised representations for Earth Observation imagery”, in *International Conference on Pattern Recognition*, 2021.
- [48] **A. Porrello**, S. Vincenzi, P. Buzzega, S. Calderara, A. Conte, C. Ippoliti, L. Candeloro, A. Di Lorenzo, and A. C. Dondona, “Spotting insects from satellites: modeling the presence of *Culicoides imicola* through Deep CNNs”, in *International Conference on Signal-Image Technology & Internet-Based Systems*, 2019.
- [49] L. Bergamini, **A. Porrello**, A. C. Dondona, E. Del Negro, M. Mattioli, N. D’alterio, and S. Calderara, “Multi-views embedding for cattle re-identification”, in *International Conference on Signal-Image Technology & Internet-Based Systems*, IEEE, 2018.

## WORKSHOPS

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- [50] G. Corso, F. Miccolis, **A. Porrello**, F. Bolelli, S. Calderara, and E. Ficarra, “Context-guided prompt learning for continual wsi classification”, in *MICCAI Workshop on Computational Pathology with Multimodal Data (COMPAYL)*, 2025.
- [51] M. Bergianti, N. Cioffo, F. Del Buono, M. Paganelli, **A. Porrello**, *et al.*, “Avoiding the pitfalls on stock market: Challenges and solutions in developing quantitative strategies”, in *CEUR WORKSHOP PROCEEDINGS*, Ital-IA, CEUR-WS, 2023.
- [52] R. Cucchiara, L. Baraldi, S. Calderara, M. Cornia, M. Fabbri, C. Grana, **A. Porrello**, and R. Vezzani, “Where research meets industry: New challenges and opportunities at aimagelab.”, *Ital-IA*, pp. 7–12, 2023.
- [53] A. Panariello, **A. Porrello**, S. Calderara, and R. Cucchiara, “Consistency-based Self-supervised Learning for Temporal Anomaly Localization”, in *European Conference on Computer Vision Workshops*, 2022.

## PREPRINTS AND TECHNICAL REPORTS (ARXIV)

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- [54] P. Buzzega, R. Salami, **A. Porrello**, and S. Calderara, “Rethinking layer-wise model merging through chain of merges”, *arXiv preprint arXiv:2508.21421*, 2025.
- [55] L. Bonicelli, M. Boschini, E. Frascaroli, **A. Porrello**, M. Pennisi, G. Bellitto, S. Palazzo, C. Spampinato, and S. Calderara, “On the effectiveness of equivariant regularization for robust online continual learning”, *arXiv preprint arXiv:2305.03648*, 2023.