

Lorenzo Pellegrini

✉ l.pellegrini@unibo.it
📄 [lrzpellegri](#)
ID [0000-0002-7680-8116](#)
🔑 [X3jGASoAAAAJ](#)

Research themes

My research activity is focused on Artificial Intelligence and Computer Vision. In particular, my primary research field is Continual Learning and concerns the experimentation and formulation of new methodologies to mitigate the phenomenon known as Catastrophic Forgetting. Another key area of my work is Deepfake detection, which involves designing novel mechanisms and benchmarks to train and evaluate models capable of determining whether digital content has been artificially generated or is authentic. Additionally, I conduct research on privacy-preserving approaches to continual learning, with a particular focus on biometric tasks such as Morphing Attack Detection (MAD).

Academic experience

Current Placement

- 2024–now **Researcher, fixed time (RTDa)**, *University of Bologna, Cesena, Italy*
- Since: 07/03/2024
 - Position covered by [FSE+ 2021-2027 funding from the Emilia-Romagna Region](#), aimed at the improvement and innovation of professionalizing university courses.

Previous

- 2022–2024 **Assegnista di Ricerca (Research Fellow)**, *University of Bologna, Cesena, Italy*
- Supervisor: Prof. Davide Maltoni
 - Tema: Biometria e Machine Learning
 - 01/02/2022 – 06/03/2024
- 2018–2024 **Teaching assistant, Machine Learning**, *University of Bologna, Cesena, Italy*
- Machine Learning course, Master's Degree in Computer Science and Engineering.
 - 5 years.
- 2021 **Research Intern, Facebook AI Research**
- Supervisor: Dr. Abhijit Ogale
 - Perception and Action Group
 - 4 months

Education

- 2018–2022 **Ph.D. in Computer Science and Engineering**, *Università di Bologna, Cesena, Italy*
- Thesis: [Continual learning for computer vision applications](#)
 - Supervisor: [Prof. Davide Maltoni](#)
 - Defense date: 23/06/2022

- 2015–2018 **M.S. in Computer Science and Engineering**, *Università di Bologna*, Cesena, Italy, 110L/110 - *Magna cum Laude*
- Thesis: [Integrazione Architetture di Personal Assistant Agent basati su modello BDI con Servizi Cognitivi: Un Caso di Studio in Ambito Ospedaliero](#)
 - Supervisor: [Prof. Alessandro Ricci](#)
- 2012–2015 **B.S. in Computer Science and Engineering**, *Università di Bologna*, Cesena, Italy, 110L/110 - *Magna cum Laude*
- Thesis: [Implementazione di una infrastruttura basata su Kafka e Storm per il Mobile Cloud computing](#)
 - Supervisor: [Prof. Mirko Viroli](#)
- 2007–2012 **Diploma**, *Liceo Scientifico Alessandro Serpieri*, Rimini, Italy, 86/100
- PNI - Matematica, Fisica, Scienze naturali

Teaching

- 2024–now **Professor, Numerical methods for Artificial Intelligence**, *University of Bologna*, Cesena, Italy
- Degree in Computer Science and Engineering
 - 2 years
- 2024–now **Professor, Elements of Computer Architectures and Operating Systems**, *University of Bologna*, Cesena and Imola, Italy
- Degree in Information systems technologies
 - 2 years
- 2026 **Introduction to Continual Learning: Challenges, Methods, and Hands-on**, *University of Bologna*, Italy
- Ph.D. Course (12 hours)
- 2023–2026 **Professor, Laboratory of Embedded Systems and IoT**, *University of Bologna*, Imola, Italy
- Degree in Information systems technologies
 - 3 years

Contract Professor

- 2023–2024 **Contract Professor, Programming**, *University of Bologna*, Cesena, Italy
- Programming course, laboratory module, Degree in Information systems technologies
 - 1 year

Tutoring

- 2018–2024 **Teaching assistant, Machine Learning**, *University of Bologna*, Cesena, Italy
- Machine Learning course, Master's Degree in Computer Science and Engineering.
 - 5 years
- 2018/19 **Teaching assistant, Algoritmi e Strutture Dati**, *University of Bologna*, Cesena, Italy
- Algoritmi e Strutture Dati course, Bachelor's Degree in Computer Science and Engineering.
 - 1 year

Awards

- 2025 **1st place**, *Adversarial Attack Challenge for Secure Face Recognition: detection track*, IJCB 2025
- 2024 **4th place**, *Face Recognition Challenge in the Era of Synthetic Data*, WACV 2024
- 2021 **Best Library award**, *Workshop on Continual Learning in Computer Vision*, CVPR 2021
- 2019 **2nd place**, *Lifelong robotic vision: object recognition challenge*, IROS 2019

Chairing

Area Chair	11th International Conference on Computer Vision & Image Processing	2026
Tech Chair	1st ContinualAI Un-Conference	2023
Challenge Chair	4th Workshop on Continual Learning in Computer Vision @ CVPR	2023
Challenge Chair	3rd Workshop on Continual Learning in Computer Vision @ CVPR	2022

Organization of competitions

- 2026 **VMAD Challenge**, *Every Frame You Take: The Video-based Morphing Attack Detection (V-MAD) Challenge at IJCB 2026*
Competition on Video-based MAD, evaluated on real and synthetic video sequences.
Competition website: <https://sites.google.com/view/vmad26competition>
- 2023 **4th CLVision Challenge**, *4th Workshop on Continual Learning in Computer Vision at CVPR 2023*
Competition on Continual Lifelong Learning in the novel Class-incremental with Repetition (CIR) setup.
Competition website: <https://sites.google.com/view/clvision2023/challenge>
- 2022 **3rd CLVision Challenge**, *3rd Workshop on Continual Learning in Computer Vision at CVPR 2022*
Competition on Continual Lifelong Learning for Object Detection in egocentric videos, based on an ad-hoc dataset (EgoObjects) provided by Meta.
Competition website: <https://sites.google.com/view/clvision2022/challenge>.
Report: <https://arxiv.org/abs/2212.06833>

Talks, presentations, tutorials

- 2026 **Invited talk**, *European Association for Biometrics*
Evaluation of MAD systems: an introduction to the Bologna Online Evaluation Platform
Event website: <https://eab.org/events/program/411>
- 2025 **Oral presentation**, *Verimedia workshop at IJCNN 2025*
AI-GenBench: A New Ongoing Benchmark for AI-Generated Image Detection
Workshop website: <https://verimediainjcn2025.github.io/workshop.website>
- 2024 **Invited speech**, *European Association for Biometrics and iMARS Project*
Transatlantic Dialogue on Presentation Attack Detection
iMARS Testing Platform - An Overview of the Bologna Online Evaluation Platform (BOEP)
Event website: <https://www.eventbrite.com/e/transatlantic-dialogue-on-presentation-attack-detection-tickets-1056461758559>

- 2024 **Invited talk**, *European Association for Biometrics*
Evaluating Morphing Attack Detectors: An Overview of the Bologna Online Evaluation Platform
Event website: <https://eab.org/events/program/334?ts=1706626738138>
- 2023 **Oral presentation**, *IEEE International Joint Conference on Biometrics (IJCB)*
Detecting Morphing Attacks via Continual Distributed Training
Conference website: <https://ijcb2023.ieee-biometrics.org/>
- 2023 **Tutorial**, *IEEE International Joint Conference on Biometrics (IJCB)*
Face Recognition and Verification: recent trends and threats. An analysis of the state-of-the-art solutions and the development of methods to contrast the recently emerged Morphing Attack
Conference website: <https://ijcb2023.ieee-biometrics.org/>
- 2021 **Poster presentation**, *European Symposium on Artificial Neural Networks, Computational Intelligence and Machine Learning (ESANN)*
Continual learning at the edge: Real-time training on smartphone devices
Conference website: <https://www.esann.org/proceedings/2021/>
- 2020 **Oral presentation**, *IEEE/RSJ International Conference on Intelligent Robots and Systems (IROS)*
Latent replay for real-time continual learning
Conference website: <https://www.iros2020.org/>

Involvement in Evaluation Commissions

- 2023 **Member, PhD Thesis Defense Committee**, *Ph.D. Defense of Angelo Garangau Menezes*, University of São Paulo at São Carlos, Brazil, Supervisor: Professor André Carlos Ponce de Leon Ferreira de Carvalho
Continual Object Detection with Deep Neural Networks

Reviewing for International Journals

- 2026 **Knowledge-Based Systems**, <https://www.sciencedirect.com/journal/knowledge-based-systems>, Online ISSN: 1872-7409
- 2026 **Pattern Recognition**, <https://www.sciencedirect.com/journal/pattern-recognition>, Online ISSN: 1873-5142
- 2026 **IEEE Transactions on Biometrics, Behavior, and Identity Science**, <https://ieee-biometrics.org/publications/t-biom>, Online ISSN: 2637-6407
- 2025 **IEEE Transactions on Biomedical Circuits and Systems**, <https://ieee-cas.org/publication/TBioCAS>, Online ISSN: 1940-9990
- 2024 **Neural Processing Letters**, <https://link.springer.com/journal/11063>, Online ISSN: 1573-773X
- 2024 **Neural Networks**, <https://www.sciencedirect.com/journal/neural-networks>, Online ISSN: 1879-2782
- 2023 **Neural Networks**, <https://www.sciencedirect.com/journal/neural-networks>, Online ISSN: 1879-2782

- 2023 **IEEE Transactions on Computer-Aided Design of Integrated Circuits and Systems**, <https://ieee-ceda.org/publication/ieee-transaction-s-computer-aided-design-integrated-circuits-systems-tcad>, Online ISSN: 1937-4151
- 2023 **Machine Learning**, <https://www.springer.com/journal/10994>, Online ISSN: 1573-0565
- 2022 **Neural Networks**, <https://www.sciencedirect.com/journal/neural-networks>, Online ISSN: 1879-2782
- 2020 **IEEE Transactions on Neural Networks and Learning Systems**, <https://cis.ieee.org/publications/t-neural-networks-and-learning-systems>, Online ISSN: 2162-2388

Program Committee member

- 2024 **4th Workshop Towards a Complete Analysis of People: From Face and Body to Clothes at ECCV 2024 (T-CAP)**, <https://sites.google.com/view/t-cap-2024/organization>
- 2023 **2nd EAI Conference on AI for People (CAIP)**, <https://aiforpeople.org/conference/>
- 2022 **2nd Workshop Towards a Complete Analysis of People: From Face and Body to Clothes at ICPR 2022 (T-CAP)**, <https://sites.google.com/view/t-cap2022/committee>
- 2022 **1st International Workshop and Challenge on People Analysis: From Face, Body and Fashion to 3D Virtual Avatars at ECCV (WCPA)**, <https://sites.google.com/view/wcpa2022/committee>
- 2021 **1st EAI Conference on AI for People: Towards Sustainable AI**, <https://aiforpeople.org/conference/2021/organisation.php>
- 2021 **1st Workshop Towards a Complete Analysis of People: From Face and Body to Clothes at ICIAP 2021 (T-CAP)**, <https://sites.google.com/view/t-cap2021/committee>
- 2020 **4th Lifelong Learning Workshop at ICML 2020 (LifelongML)**, <https://lifelongml.github.io/fourth-workshop/organizers/>

Reviewing for Conferences and Workshops

- 2025 **IEEE/RSJ International Conference on Intelligent Robots and Systems (IROS)**
- 2024 **4th Workshop Towards a Complete Analysis of People: From Face and Body to Clothes at ECCV 2024 (T-CAP)**
- 2024 **IEEE International Conference on Robotics and Automation (ICRA)**
- 2024 **5th Workshop on Continual Learning in Computer Vision at CVPR 2024 (CLVISION)**
- 2023 **41st IEEE Conference on Robotics and Automation (ICRA)**
- 2023 **2nd EAI Conference on AI for People (CAIP)**

- 2023 **4th Workshop on Continual Learning in Computer Vision at CVPR 2023 (CLVISION)**
- 2022 **3rd Workshop on Continual Learning in Computer Vision at CVPR 2022 (CLVISION)**
- 2022 **2nd Workshop Towards a Complete Analysis of People: From Face and Body to Clothes at ICPR 2022 (T-CAP)**
- 2022 **1st International Workshop and Challenge on People Analysis: From Face, Body and Fashion to 3D Virtual Avatars at ECCV (WCPA)**
- 2021 **1st EAI Conference on AI for People (CAIP)**
- 2021 **2nd Workshop on Continual Learning in Computer Vision at CVPR 2021 (CLVISION)**
- 2021 **1st Workshop Towards a Complete Analysis of People: From Face and Body to Clothes at ICIAP 2021 (T-CAP)**
- 2020 **1st Workshop on Continual Learning in Computer Vision at CVPR 2020 (CLVISION)**
- 2020 **2020 IEEE International Conference on Evolving and Adaptive Intelligent Systems (EAIS)**
- 2020 **24th European Conference on Artificial Intelligence (ECAI)**
- 2020 **29th International Joint Conferences on Artificial Intelligence (IJCAI)**
- 2020 **4th Lifelong Learning Workshop at ICML 2020 (LifelongML)**

Software

- April 2020 - **Lead Maintainer**, *Avalanche: an End-to-End Library for Continual Learning*, now ContinualAI, <https://avalanche.continualai.org/>
 Avalanche is an end-to-end Continual Learning library based on Pytorch, born within ContinualAI with the unique goal of providing a shared and collaborative open-source (MIT licensed) codebase for fast prototyping, training and reproducible evaluation of continual learning algorithms.
 The project currently has 1400 stars and 240 forks on GitHub: <https://github.com/ContinualAI/avalanche>.
 I was the main designer and implementer of the first versions of Avalanche and I'm currently the Lead Maintainer of the Benchmarks module.
- April 2020 - **Designer and Implementer**, *Continual Object Recognition App*, SmartCity-BioLab, now University of Bologna, <https://github.com/lrzpellegrini/CL-CORe-App/>
 The CORe (Continual Object Recognition) App is an Artificial Vision application for Android devices that can classify objects from the CORe50 dataset and also learn how to classify objects of new categories by using the AR1* Continual Learning Algorithm with Latent Replay (more info in the Papers sections). All the inference and training tasks are performed on-device, offline and without accelerators.
 Short video demo: <https://youtu.be/Bs3tSjwbHa4>.

Metrics

At 23/06/2026 ([Google Scholar profile](#)):

○ Citations: 1218

- H-Index: 13
- i10-index: 15

Publications

Thesis

L. Pellegrini, "Continual learning for computer vision applications," Ph.D. dissertation, Università di Bologna, 2022.

Book Chapters

D. Maltoni, L. Pellegrini, and M. Scucchia, "The Design Principles of Gen-AI Algorithms," in *The Cyber-Creativity Process: How Humans Co-Create with Artificial Intelligence*, G. E. Corazza, Ed., Cham: Springer Nature Switzerland, 2025, pp. 33–69, ISBN: 978-3-031-84535-2. DOI: [10.1007/978-3-031-84535-2_2](https://doi.org/10.1007/978-3-031-84535-2_2)

V. Lomonaco, L. Pellegrini, G. Graffieti, and D. Maltoni, "Architect, Regularize and Replay (ARR): a Flexible Hybrid Approach for Continual Learning," in *Towards Human Brain Inspired Lifelong Learning*, X. Li, R. Savitha, A. Ambikapathi, S. Sundaram, and H. M. Fayek, Eds., Singapore: World Scientific Publishing, 2024, ch. 6. DOI: [10.1142/13689](https://doi.org/10.1142/13689)

Journal

L. Pellegrini, G. Borghi, A. Franco, and D. Maltoni, "Adaptive-lwf: Continual training of morphing attack detector without forgetting," *Frontiers in Imaging*, vol. 5, 2026, ISSN: 2813-3315. DOI: [10.3389/fimag.2026.1817515](https://doi.org/10.3389/fimag.2026.1817515)

H. Hemati et al., "Continual learning in the presence of repetition," *Neural Networks*, vol. 183, p. 106 920, 2025, ISSN: 0893-6080. DOI: <https://doi.org/10.1016/j.neunet.2024.106920>

P. Melzi et al., "Frcsyn-ongoing: Benchmarking and comprehensive evaluation of real and synthetic data to improve face recognition systems," *Information Fusion*, vol. 107, p. 102 322, 2024, ISSN: 1566-2535. DOI: <https://doi.org/10.1016/j.inffus.2024.102322>

A. Carta, L. Pellegrini, A. Cossu, H. Hemati, and V. Lomonaco, "Avalanche: A pytorch library for deep continual learning," *Journal of Machine Learning Research*, vol. 24, no. 363, pp. 1–6, 2023.

G. Graffieti, D. Maltoni, L. Pellegrini, and V. Lomonaco, "Generative negative replay for continual learning," *Neural Networks*, vol. 162, pp. 369–383, 2023, ISSN: 0893-6080. DOI: [10.1016/j.neunet.2023.03.006](https://doi.org/10.1016/j.neunet.2023.03.006) [ScimagoJR: Q1 (Artificial Intelligence)].

L. Pellegrini et al., "A weakly supervised approach for recycling code recognition," *Expert Systems with Applications*, vol. 215, p. 119 282, 2023, ISSN: 0957-4174. DOI: [10.1016/j.eswa.2022.119282](https://doi.org/10.1016/j.eswa.2022.119282) [ScimagoJR: Q1 (Artificial Intelligence)].

A. Cossu et al., "Is class-incremental enough for continual learning?" *Frontiers in Artificial Intelligence*, vol. 5, 2022, ISSN: 2624-8212. DOI: [10.3389/frai.2022.829842](https://doi.org/10.3389/frai.2022.829842) [ScimagoJR: Q2 (Artificial Intelligence)].

V. Lomonaco et al., "Cvpr 2020 continual learning in computer vision competition: Approaches, results, current challenges and future directions," *Artificial Intelligence*, vol. 303, p. 103 635, 2022, ISSN: 0004-3702. DOI: [10.1016/j.artint.2021.103635](https://doi.org/10.1016/j.artint.2021.103635) [ScimagoJR: Q1 (Artificial Intelligence)].

H. Bae et al., "Iros 2019 lifelong robotic vision: Object recognition challenge [competitions]," *IEEE Robotics and Automation Magazine*, vol. 27, no. 2, pp. 11–16, 2020. DOI: [10.1109/MRA.2020.2987186](https://doi.org/10.1109/MRA.2020.2987186) [ScimagoJR: Q1 (Computer Science Applications)].

Conference and Workshops

- D. Domini, G. Aguzzi, L. Pellegrini, M. Viroli, and L. Esterle, "C2FL: Clustered continual federated learning under spatial and temporal drift," in *Proceedings of the IEEE International Conference on Autonomic Computing and Self-Organizing Systems (ACSOS)*, 2026.
- S. Pandolfini, L. Pellegrini, M. Ferrara, and D. Maltoni, "Detecting Localized Deepfakes: How Well Do Synthetic Image Detectors Handle Inpainting?" In *Proceedings of the Joint National Conference on Cybersecurity*, 2026.
- L. Pellegrini et al., "Ai-genbench: A new ongoing benchmark for ai-generated image detection," in *2025 International Joint Conference on Neural Networks (IJCNN)*, 2025, pp. 1–9. DOI: [10.1109/IJCNN64981.2025.11228377](https://doi.org/10.1109/IJCNN64981.2025.11228377)
- J. Tremoço et al., "Adversarial attack challenge for secure face recognition 2025," in *Proceedings of the International Joint Conference on Biometrics (IJCB)*, 2025.
- P. Melzi et al., "FRCSyn Challenge at WACV 2024: Face Recognition Challenge in the Era of Synthetic Data," in *2024 IEEE/CVF Winter Conference on Applications of Computer Vision Workshops (WACVW)*, Los Alamitos, CA, USA: IEEE Computer Society, Jan. 2024, pp. 892–901. DOI: [10.1109/WACVW60836.2024.00100](https://doi.org/10.1109/WACVW60836.2024.00100)
- H. Hemati et al., "Class-incremental learning with repetition," in *Proceedings of The 2nd Conference on Lifelong Learning Agents*, S. Chandar, R. Pascanu, H. Sedghi, and D. Precup, Eds., ser. Proceedings of Machine Learning Research, vol. 232, PMLR, Aug. 2023, pp. 437–455.
- L. Pellegrini, G. Borghi, A. Franco, and D. Maltoni, "Detecting morphing attacks via continual incremental training," in *2023 IEEE International Joint Conference on Biometrics (IJCB)*, Sep. 2023, pp. 1–10. DOI: [10.1109/IJCB57857.2023.10449306](https://doi.org/10.1109/IJCB57857.2023.10449306)
- V. Lomonaco et al., "Avalanche: An end-to-end library for continual learning," in *2021 IEEE/CVF Conference on Computer Vision and Pattern Recognition Workshops (CVPRW)*, 2021, pp. 3595–3605. DOI: [10.1109/CVPRW53098.2021.00399](https://doi.org/10.1109/CVPRW53098.2021.00399)
- L. Pellegrini, L. Vincenzo, G. Graffieti, D. Maltoni, et al., "Continual learning at the edge: Real-time training on smartphone devices," in *2021 European Symposium on Artificial Neural Networks, Computational Intelligence and Machine Learning (ESANN)*, 2021, pp. 23–28. DOI: [10.14428/esa-nn/2021.ES2021-136](https://doi.org/10.14428/esa-nn/2021.ES2021-136)
- V. Lomonaco, D. Maltoni, and L. Pellegrini, "Rehearsal-free continual learning over small non-i.i.d. batches," in *2020 IEEE/CVF Conference on Computer Vision and Pattern Recognition Workshops (CVPRW)*, 2020, pp. 989–998. DOI: [10.1109/CVPRW50498.2020.00131](https://doi.org/10.1109/CVPRW50498.2020.00131)
- L. Pellegrini, G. Graffieti, V. Lomonaco, and D. Maltoni, "Latent replay for real-time continual learning," in *2020 IEEE/RSJ International Conference on Intelligent Robots and Systems (IROS)*, 2020, pp. 10 203–10 209. DOI: [10.1109/IROS45743.2020.9341460](https://doi.org/10.1109/IROS45743.2020.9341460)
- L. Ravaglia et al., "Memory-latency-accuracy trade-offs for continual learning on a risc-v extreme-edge node," in *2020 IEEE Workshop on Signal Processing Systems (SiPS)*, 2020, pp. 1–6. DOI: [10.1109/SiPS50750.2020.9195220](https://doi.org/10.1109/SiPS50750.2020.9195220)