

Postdoctoral Fellow, Vector Institute

I am interested in making Machine Learning models and training algorithms efficient, with applications to Vision and Language. My research focuses on building modular intelligent systems that can learn continually and solve new problems by reusing and improving previously learned skills.

ACADEMIC EXPERIENCE **Vector Institute**, Toronto, Canada
 Postdoctoral Fellow Oct 2024 - Present
 Advisor: [Colin Raffel](#)

Politecnico di Torino, Italy
 ELLIS Postdoctoral Researcher June 2021 - Sep 2024
 Advisors: [Barbara Caputo](#), [Tatiana Tommasi](#)

University College London, UK
 Honorary Research Fellow, with [Carlo Ciliberto](#) Jan - Nov 2022

PROFESSIONAL EXPERIENCE • **Research Intern: NVIDIA**, Santa Clara Aug - Nov 2018
 Topic: Adversarial Robustness of Neural Networks
 Supervisors: [Iuri Frosio](#), [Pavlo Molchanov](#)

• **Research Intern: NNAISENSE**, Lugano July 2017 - Jan 2018
 Topic: Stability of Residual Networks
 Supervisors: [Jonathan Masci](#)

• **ML Engineer: Horus Technology**, Milan June 2016 - June 2017
 Topic: Efficient Computer Vision models for embedded devices

• **Software Engineer: Projest S.p.A.** Nov 2009 - Oct 2012
 Topic: Web Development

EDUCATION **Politecnico di Milano**, Italy
 Ph.D., Information Technology - Computer Science and Engineering April 2021
 • Thesis: *Iterative and Conditional Computation for Visual Representation Learning*
 • Advisors: [Matteo Matteucci](#), [Jonathan Masci](#)
 • Grade: *cum Laude*
 M.Sc., Computer Science and Engineering April 2016
 • Thesis: *Semantic Segmentation of urban scenes with Recurrent Deep Neural Networks*
 • Advisors: [Matteo Matteucci](#), [Francesco Visin](#)
 • Grade: *110 cum Laude/110*

Romanian Institute of Science and Technology, Cluj-Napoca, Romania
 Visiting Ph.D. student, advised by [Luigi Malago](#) May-July 2018
 Topic: *Information Geometry of Adversarial Robustness of Neural Networks*

Università degli Studi di Firenze, Italy

BSc in Computer Engineering, July 2013

- Thesis: *Blind Source Separation methods for multichannel audio signals based on Independent Component Analysis*
- Advisor: [Prof. Fabrizio Argenti](#)
- Grade: 97/110

GRANTS	<ul style="list-style-type: none">• Cineca ISCRA-B FedVis (PI): 1,800,000 GPU hours 2023• Cineca ISCRA-C FedPers (PI): 95,000 GPU hours 2022• Cineca ISCRA-C FedUDAS (PI): 37,000 GPU hours 2021• Cineca ISCRA-C FedMoE (PI): 52,000 GPU hours 2021
HONORS AND AWARDS	<ul style="list-style-type: none">• ICLR outstanding/notable reviewer 2021• Best paper award, NeurIPS CooperativeAI Workshop 2021• Best paper award, CVPR Workshop on Event-based Vision Smart Cameras 2019• Best paper award, CVPR DeepVision Workshop 2016• National Doctoral Scholarship 2016-2019
SERVICE	Chair and Organizer <ul style="list-style-type: none">• Competition chair NeurIPS 2023 2023 (co-chair with Tao Qin and Jake Albrecht)• Competition chair NeurIPS 2022 2022 (co-chair with Gustavo Stolovitzky and Jake Albrecht)• Demonstration and Competition chair NeurIPS 2021 2021 (co-chair with Barbara Caputo and Douwe Kiela)
ATTENDED SCHOOLS	<ul style="list-style-type: none">• SOCL 2018 Toronto, Canada 30 Nov - 1 Dec 2018 <i>Selected on application - travel grant</i>• TMLSS 2018, Cluj, Romania 16-22 July 2018 <i>Acceptance Rate: 8%</i>• MLSS 2017, Tübingen, Germany 19-30 June 2017 <i>Acceptance Rate: 13%</i>• ICVSS 2017, Sicily, Italy 9-15 July 2017 <i>Acceptance Rate: 35%</i>
TEACHING	<ul style="list-style-type: none">• M2L 2022: Colab on Graph Neural Networks (Tutorial) Summer 2022• M2L 2021: Colab on Variational Auto-Encoders (Tutorial) Winter 2021• Politecnico di Milano: Deep Learning (TA) Winter 2018• Politecnico di Milano: Cognitive Robotics (TA) Spring 2017
ADVISING	PhD Students <ul style="list-style-type: none">• Debora Caldarola (co-supervised with Barbara Caputo) 2021-• Eros Fani (co-supervised with Barbara Caputo) 2021-• Riccardo Zaccone (co-supervised with Carlo Masone) 2023-• Leonardo Iurada (co-supervised with Tatiana Tommasi) 2023-
SKILLS	<ul style="list-style-type: none">• Python, C, C++, CUDA, Matlab, Bash, Git• PyTorch, JAX, TensorFlow, Theano

PUBLICATIONS

1. Riccardo Zaccone, Carlo Masone, and **Marco Ciccone**. [Communication-Efficient Heterogeneous Federated Learning with Generalized Heavy-Ball Momentum](#). *under review*, 2024
2. Claudia Cuttano, Gabriele Rosi, Niccolò Cavagnero, Francesca Pistilli, **Marco Ciccone**, Fabio Cermelli, and Giuseppe Averta. [Eris: Referring image segmentation via efficient multi-modal alignment](#). *under review*, 2024
3. Eros Fani, Raffaello Camoriano, Barbara Caputo, and **Marco Ciccone**. [Accelerating Heterogeneous Federated Learning with Closed-form Classifiers](#). *Proceedings of the 41th International Conference on Machine Learning (ICML)*, 2024
4. Leonardo Iurada, **Marco Ciccone**, and Tatiana Tommasi. [Finding Lottery Tickets in Vision Models via Data-driven Spectral Foresight Pruning](#). *Proceedings of the IEEE/CVF Conference on Computer Vision and Pattern Recognition (CVPR)*, 2024
5. Niccolò Cavagnero, Gabriele Rosi, Claudia Cuttano, Francesca Pistilli, **Marco Ciccone**, Giuseppe Averta, and Fabio Cermelli. [PEM: Prototype-based Efficient MaskFormer for Image Segmentation](#). *Proceedings of the IEEE/CVF Conference on Computer Vision and Pattern Recognition (CVPR)*, 2024
6. Donato Crisostomi, Irene Cannistraci, Luca Moschella, Pietro Barbiero, **Marco Ciccone**, Pietro Lio, and Emanuele Rodolà. [From Charts to Atlas: Merging Latent Spaces into One](#). In *NeurIPS Workshop on Symmetry and Geometry in Neural Representations*, 2023
7. Eros Fani, Raffaello Camoriano, Barbara Caputo, and **Marco Ciccone**. [Fed3R: Recursive Ridge Regression for Federated Learning with strong pre-trained models](#). *NeurIPS Workshop on Federated Learning in the Age of Foundation Models*, 2023
8. Debora Caldarola, Barbara Caputo, and **Marco Ciccone**. [Window-based Model Averaging Improves Generalization in Heterogeneous Federated Learning](#). *Proceedings of the IEEE/CVF International Conference on Computer Vision Workshops (CVPRW)*, 2023
9. Ruohan Wang^{*}, **Marco Ciccone**^{*}, Giulia Luise, Massimiliano Pontil, Andrew Yapp, and Carlo Ciliberto. [Schedule-Robust Online Continual Learning](#). *submitted to IEEE TPAMI*, 2022
10. Donald Shenaj, Eros Fani, Marco Toldo, Debora Caldarola, Antonio Tavera, Umberto Michieli[†], **Marco[†] Ciccone**, Pietro Zanuttigh[†], and Barbara Caputo[†]. [Learning Across Domains and Devices: Style-Driven Source-Free Domain Adaptation in Clustered Federated Learning](#). *IEEE Winter Conference on Applications of Computer Vision (WACV)*, 2023
11. Niccolò Cavagnero, Fernando Dos Santos, Marco Ciccone, Giuseppe Averta, Tatiana Tommasi, and Paolo Rech. [Transient-Fault-Aware Design and Training to Enhance DNNs Reliability with Zero-Overhead](#). *IEEE 28th International Symposium on On-Line Testing and Robust System Design (IOLTS)*, 2022
12. Debora Caldarola^{*}, Barbara Caputo, and **Marco Ciccone**^{*}. [Improving Generalization in Federated Learning by Seeking Flat Minima](#). *European Conference on Computer Vision (ECCV)*, 2022
13. Lidia Fantauzzo, Eros Fani, Debora Caldarola, Antonio Tavera, Fabio Cermelli, **Marco Ciccone**, and Barbara Caputo. [FedDrive: Generalizing Federated Learning to Semantic Segmentation in Autonomous Driving](#). *Proceedings of the 2022 IEEE/RSJ International Conference on Intelligent Robots and Systems (IROS)*, 2022
14. Riccardo Zaccone, Andrea Rizzardi, Debora Caldarola, **Marco Ciccone**, and Barbara Caputo. [Speeding up Heterogeneous Federated Learning with Sequentially Trained Superclients](#). *26th International Conference on Pattern Recognition (ICPR)*, 2022
15. Luca Carminati, Federico Cacciamani, **Marco Ciccone**, and Nicola Gatti. [A Marriage between Adversarial Team Games and 2-Player Games: Enabling Abstractions, No-regret Learning, and Subgame Solving](#). *Proceedings of the 39th International Conference on Machine Learning (ICML)*, 2022
16. Fabio Cermelli, Dario Fontanel, Antonio Tavera, **Marco Ciccone**, and Barbara Caputo. [Incremental Learning in Semantic Segmentation from Image Labels](#). *Proceedings of the IEEE/CVF Conference on Computer Vision and Pattern Recognition (CVPR)*, June 2022

^{*} equal contribution, [†] equal supervision

17. Luca Carminati, Federico Cacciamani, **Marco Ciccone**, and Nicola Gatti. [Public Information Representation for Adversarial Team Games](#). *NeurIPS Workshop CooperativeAI*, 2021 (*oral and best paper award*)
18. Mirco Planamente, Chiara Plizzari, Marco Cannici, **Marco Ciccone**, Francesco Strada, Andrea Bottino, Matteo Matteucci, and Barbara Caputo. [DA4Event: Towards Bridging the Sim-to-Real Gap for Event Cameras Using Domain Adaptation](#). *IEEE Robotics and Automation Letters*, 2021
19. Debora Caldarola, Massimiliano Mancini, Fabio Galasso, **Marco Ciccone**, Emanuele Rodola, and Barbara Caputo. [Cluster-Driven Graph Federated Learning Over Multiple Domains](#). *Proceedings of the IEEE/CVF Conference on Computer Vision and Pattern Recognition Workshops (CVPRW)*, 2021
20. Marco Cannici, Chiara Plizzari, Mirco Planamente, **Marco Ciccone**, Andrea Bottino, Barbara Caputo, and Matteo Matteucci. [N-ROD: A Neuromorphic Dataset for Synthetic-to-Real Domain Adaptation](#). *Proceedings of the IEEE/CVF Conference on Computer Vision and Pattern Recognition Workshops (CVPRW)*, 2021
21. Federico Cacciamani, Andrea Celli, **Marco Ciccone**, and Nicola Gatti. [Multi-Agent Coordination in Adversarial Environments through Signal Mediated Strategies](#). *Proceedings of the 20th International Conference on Autonomous Agents and Multiagent Systems (AAMAS)*, 2021
22. Marco Cannici, **Marco Ciccone**, Andrea Romanoni, and Matteo Matteucci. [A Differentiable Recurrent Surface for Asynchronous Event-Based Data](#). *Proceedings of the European Conference on Computer Vision (ECCV)*, 2020
23. Marco Cannici, **Marco Ciccone**, Andrea Romanoni, and Matteo Matteucci. [Asynchronous Convolutional Networks for Object Detection in Neuromorphic Cameras](#). *Proceedings of the IEEE/CVF Conference on Computer Vision and Pattern Recognition Workshops (CVPRW)*, 2019 (*best paper award*)
24. Marco Cannici, **Marco Ciccone**, Andrea Romanoni, and Matteo Matteucci. [Attention Mechanisms for Object Recognition with Event-Based Cameras](#). *Proceedings of the IEEE Winter Conference on Applications of Computer Vision (WACV)*, 2019
25. **Marco Ciccone**^{*}, Marco Gallieri^{*}, Jonathan Masci, Christian Osendorfer, and Faustino Gomez. [NAIS-Net: Stable Deep Networks from Non-Autonomous Differential Equations](#). *Advances in Neural Information Processing Systems (NeurIPS)*, 2018
26. Francesco Lattari^{*}, **Marco Ciccone**^{*}, Matteo Matteucci, Jonathan Masci, and Francesco Visin. [ReConvNet: Video Object Segmentation with Spatio-Temporal Features Modulation](#). *The 2018 DAVIS Challenge on Video Object Segmentation - CVPR Workshops*, 2018
27. Andrea Romanoni, **Marco Ciccone**, Francesco Visin, and Matteo Matteucci. [Multi-View Stereo with Single-View Semantic Mesh Refinement](#). *Proceedings of the IEEE International Conference on Computer Vision Workshops (ICCVW)*, 2017
28. Francesco Visin, **Marco Ciccone**, Adriana Romero, Kyle Kastner, Kyunghyun Cho, Yoshua Bengio, Matteo Matteucci, and Aaron Courville. [ReSeg : A Recurrent Neural Network-based Model for Semantic Segmentation](#). *Proceedings of the IEEE/CVF Conference on Computer Vision and Pattern Recognition Workshops (CVPRW)*, 2016 (*best paper award*)