

Massimiliano Mancini

Postdoc @ Explainable Machine Learning Lab
University of Tübingen, (Tübingen, Germany)
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Education

Ph.D. in Engineering in Computer Science November 2016 - December 2020
Sapienza University of Rome (Rome, Italy)
Advisor: Prof. Barbara Caputo, Prof. Elisa Ricci
Thesis title: *Towards Recognizing New Semantic Concepts in New Visual Domains*
External reviewers: Prof. Bernt Schiele, Prof. Timothy M. Hospedales
Award date: 7/12/2020
Grade: Excellent cum laude.

Master of Science in Artificial Intelligence and Robotics
Sapienza University of Rome (Rome, Italy) October 2014 - October 2016
Supervisor: Prof. Barbara Caputo
Thesis title: *Deep Naïve Bayes Nearest Neighbor*.
Grade: 110/110 cum laude and excellence mention.

Bachelor degree in Computer and Electronic Engineering
University of Perugia (Perugia, Italy) October 2010 - May 2014
Supervisor: Prof. Emilio Di Giacomo
Thesis title: *Project and realization of a software system for the use of a mobile device as a webcam for computer*.
Grade: 101/110.

Ph.D. Schools

International Computer Vision Summer School July 2018
Scicli, Italy
Organizers: Prof. Roberto Cipolla (University of Cambridge, UK), Prof. Sebastiano Battiato (University of Catania, Italy), Prof. Giovanni Maria Farinella (University of Catania, Italy)

Regularization Methods for Machine Learning June 27th - July 1st 2017
Genova, Italy
Organizers: Dr. Alessandro Rudi (University of Genova, Italy), Raffaello Camoriano (Italian Institute of Technology and University of Genova, Italy), Dr. Silvia Villa (Italian Institute of Technology, Italy)

Research Experience

Explainable Machine Learning Laboratory December 2020 - present
University of Tübingen (Tübingen, Germany)
Position: Postdoctoral Researcher
Supervisor: Prof. Zeynep Akata
Main topic: Zero-Shot Learning and Compositionality

Explainable Machine Learning Laboratory July 2020 - December 2020
University of Tübingen (Tübingen, Germany)
Position: Ph.D. Researcher
Supervisor: Prof. Zeynep Akata
Main topic: Zero-Shot Learning and Compositionality

ELLIS PhD & PostDoc Program March 2020 - June 2020
European Laboratory for Learning and Intelligent Systems (ELLIS Society)
Position: Ph.D. Student
Primary Host: Prof. Barbara Caputo
Exchange Host: Prof. Zeynep Akata
Main topic: Zero-Shot Adaptation and Learning.

Visual and Multimodal Applied Learning (VANDAL) May 2019 - May 2020
Istituto Italiano di Tecnologia (Turin, Italy)
Position: Research Fellow
Head of the Laboratory: Prof. Barbara Caputo
Main topic: Incremental Class Learning for Semantic Segmentation.

Robotics Perception and Learning laboratory (RPL) Summer 2018
KTH Royal Institute of Technology (Stockholm, Sweden)
Position: Visiting Ph.D. Student
Supervisors: Dr. Hakan Karaoguz, Prof. Patric Jensfelt
Main topic: Development of an online incremental class learning algorithm for deep learning detection architectures on a YuMi robotic platform.

Technologies of Vision laboratory (TeV) January 2017 - January 2020
Fondazione Bruno Kessler (Trento, Italy)
Position: Research Collaborator
Head of the Laboratory: Dr. Stefano Messelodi
Main topic: Generalization and Robustness of Convolutional Neural Networks.

Technologies of Vision laboratory (TeV) July 2016 - September 2016
Fondazione Bruno Kessler (Trento, Italy)
Position: Intern
Supervisor: Prof. Elisa Ricci
Main topic: End-to-end training of Convolutional Neural Networks for Scene Recognition using a Nave Bayes Nearest Neighbor based classifier.

Linguistic Computing Laboratory (LCL) October 2015 - March 2016
Sapienza University of Rome (Rome, Italy)
Position: Master Student
Supervisor: Prof. Roberto Navigli
Main topic: Development of an algorithm for simultaneously producing word and sense embeddings from text corpora.

Publications

2021 G. Pastore, F. Cermelli, Y. Xian, M. Mancini, Z. Akata, B. Caputo
A Closer Look at Self-training for Zero-Label Semantic Segmentation under Shifting Visual Domains
CVPR Workshop on Learning from Limited and Imperfect Data 2021.

D. Caldarola, M. Mancini, F. Galasso, M. Ciccone, E. Rodolà, B. Caputo
Cluster-driven Graph Federated Learning over Multiple Domains
CVPR Workshop on Learning from Limited and Imperfect Data 2021.

D. Fontanel, F. Cermelli, M. Mancini, B. Caputo
On the Challenges of Open World Recognition under Shifting Visual Domains
CVPR Workshop on Safe and Artificial Intelligence for Automated Driving 2021.

M. Mancini, M. F. Naeem, Y. Xian, Z. Akata
Open World Compositional Zero-Shot Learning
IEEE/CVF Computer Vision and Pattern Recognition (CVPR) 2021.

D. Fontanel, F. Cermelli, M. Mancini, B. Caputo
On the Challenges of Open World Recognition under Shifting Visual Domains
IEEE Robotics and Automation Letters, April 2021, vol. 6, n. 2, pp. 604-611.

2020

L. O. Vasconcelos, M. Mancini, D. Boscaini, S. Rota Bulò, B. Caputo, E. Ricci
Shape Consistent 2D Keypoint Estimation under Domain Shift
International Conference on Pattern Recognition (ICPR) 2020.

M. Mancini, Z. Akata, E. Ricci, B. Caputo
Towards Recognizing Unseen Categories in Unseen Domains
European Computer Vision Conference (ECCV) 2020.

D. Fontanel, F. Cermelli, M. Mancini, S. Rota Bulò, E. Ricci, B. Caputo
Boosting Open World Recognition by Clustering
IEEE Robotics and Automation Letters, October 2020, vol. 5, n. 4, pp. 5985-5992.

M. Mancini, E. Ricci, B. Caputo, S. Rota Bulò
Boosting Binary Masks for Multi-Domain Learning through Affine Transformations
Machine Vision and Applications 31, 42 (2020).

F. Cermelli, M. Mancini, S. Rota Bulò, E. Ricci, B. Caputo
Modelling the Background for Incremental Learning in Semantic Segmentation
IEEE/CVF Computer Vision and Pattern Recognition (CVPR) 2020.

2019

M. Mancini, L. Porzi, F. Cermelli, B. Caputo
Discovering Latent Domains for Unsupervised Domain Adaptation Through Consistency
International Conference on Image Analysis and Processing (ICIAP) 2019.

L. O. Vasconcelos, M. Mancini, D. Boscaini, B. Caputo, E. Ricci
Structured Domain Adaptation for 3D Keypoint Estimation
International Conference on 3D Vision (3DV) 2019. (**oral**)

M. Mancini, L. Porzi, S. Rota Bulò, B. Caputo, E. Ricci
Inferring Latent Domains for Unsupervised Deep Domain Adaptation
IEEE Transactions on Pattern Analysis & Machine Intelligence 2019.

F. Cermelli, M. Mancini, E. Ricci, B. Caputo
The RGB-D Triathlon: Towards Agile Visual Toolboxes for Robots
IEEE/RSJ International Conference on Intelligent Robots and Systems (IROS) 2019.

M. Mancini, S. Rota Bulò, B. Caputo, E. Ricci
AdaGraph: Unifying Predictive and Continuous Domain Adaptation through Graphs
IEEE/CVF Computer Vision and Pattern Recognition (CVPR) 2019. **(oral)**

M. Mancini, H. Karaoguz, E. Ricci, P. Jensfelt, B. Caputo
Knowledge is Never Enough: Towards Web Aided Deep Open World Recognition
IEEE International Conference on Robotics and Automation (ICRA) 2019.

2018

M. Mancini, E. Ricci, B. Caputo, S. Rota Bulò
Adding New Tasks to a Single Network with Weight Transformations using Binary Masks
ECCV Workshop on Transferring and Adapting Source Knowledge in Computer Vision 2018. **(best paper award honorable mention)**

M. Mancini, H. Karaoguz, E. Ricci, P. Jensfelt, B. Caputo
Kitting in the Wild through Online Domain Adaptation
IEEE/RSJ International Conference on Intelligent Robots and Systems (IROS) 2018.

M. Mancini, S. Rota Bulò, B. Caputo, E. Ricci
Best sources forward: domain generalization through source-specific nets
IEEE International Conference on Image Processing (ICIP) 2018.

M. Mancini, L. Porzi, S. Rota Bulò, B. Caputo, E. Ricci
Boosting Domain Adaptation by Discovering Latent Domains
IEEE Computer Vision and Pattern Recognition (CVPR) 2018. **(spotlight)**

M. Mancini, S. Rota Bulò, B. Caputo, E. Ricci
Robust Place Categorization with Deep Domain Generalization
IEEE Robotics and Automation Letters, July 2018, vol. 3, n. 3, pp. 2093-2100.

2017

M. Mancini, S. Rota Bulò, E. Ricci, B. Caputo
Learning Deep NBNN Representations for Robust Place Categorization
IEEE Robotics and Automation Letters, May 2017, vol. 3, n. 2, pp. 1794-1801.
(Presented at IROS 2017)

M. Mancini, J. Camacho-Collados, I. Iacobacci, R. Navigli
Embedding Words and Senses together via Joint Knowledge-Enhanced Training
Proceedings of the SIGNLL Conference on Computational Natural Language Learning (CoNLL) 2017, pp. 100-111.

Master's thesis supervision

The RGB-D Triathlon Challenge: Towards Agile Visual Toolboxes for Robots

Politecnico di Torino (Torino, Italy)

Student: **Fabio Cermelli**

Co-supervisors: Prof. Fabrizio Lamberti, Prof. Paolo Montuschi, Prof. Barbara Caputo

Build your dataset: a guide to procedural scene generation and annotation in Unity

University of Trento (Trento, Italy)

Student: **Alessandro Rizzuto**

Co-supervisor: Prof. Elisa Ricci

Improving representations for Incremental Class Learning

Politecnico di Torino (Torino, Italy)

Student: **Dario Fontanel**

Co-supervisors: Prof. Barbara Caputo, Fabio Cermelli

Towards Real World Federated Learning

Politecnico di Torino (Torino, Italy)

Student: **Debora Caldarola**

Co-supervisors: Prof. Barbara Caputo, Prof. Fabio Galasso

On the importance of Pseudo-Labeling for Generalized Zero-Shot Semantic Segmentation

Politecnico di Torino (Torino, Italy)

Student: **Giuseppe Pastore**

Co-supervisors: Prof. Barbara Caputo, Prof. Matteo Matteucci, Prof. Zeynep Akata, Dr. Yongqin Xian, Fabio Cermelli

Explainability-aided Domain Generalization for Image Classification

University of Tübingen (Tübingen, Germany)

Student: **Robin M. Schmidt**

Co-supervisors: Prof. Zeynep Akata

Awards and Acknowledgements

Excellent Ph.D. student

March 2021

Fondazione Bruno Kessler (Trento, Italy)

Awarded to Ph.D. students fulfilling research excellence criterions.

Outstanding reviewer

- IEEE/CVF International Conference on Computer Vision (ICCV) 2019
- IEEE/CVF International Conference on Computer Vision and Pattern Recognition (CVPR) 2019, 2021
- Pattern Recognition

Doctoral Consortium mentee

June 2020

IEEE/CVF International Conference on Computer Vision and Pattern Recognition

Mentor: Prof. Bernt Schiele

Best Paper Award Honorable mention

September 2018

ECCV Workshop on Transferring and Adapting Source Knowledge in Computer Vision (Munich, Germany)

For the work *Adding New Tasks to a Single Network with Weight Transformations using Binary Masks*.

Reading Group Competition Winner

July 2017

International Computer Vision Summer School 2018 (Scicli, Italy)

Member of the winning team of the reading group competition, with Julian Zilly, Amit Boyarski, Micael Carvalho, Amir Atapour Abarghouei, Konstantinos Amplianitis, Aleksandr Krasnov, Hernn Gonzalez, Riccardo Spezialetti, Carlos Sampedro Prez.

Excellent graduate student

May 2017

Sapienza University of Rome (Rome, Italy)

Awarded to the best graduate students of the year.

Services**Conference Organization:**

- Publicity/Web Chair at International Conference on Image Analysis and Processing (ICIAP) 2019

Organizers of the following workshops:

- 1st International Workshop on Industrial Machine Learning (in ICPR 2020)

Organizers of the following tutorials:

- Transferring Knowledge Across Domains: an Introduction to Deep Domain Adaptation (in ICIAP 2019)

Reviewer for the following journals:

- IEEE Transactions on Pattern Analysis and Machine Intelligence
- International Journal of Computer Vision
- IEEE Transactions on Image Processing
- IEEE Transactions on Multimedia
- Computer Vision and Image Understanding
- IET Computer Vision
- International Journal of Machine Learning and Cybernetics
- Pattern Recognition
- IEEE Robotics and Automation Letters
- Machine Vision and Applications
- Engineering Reports

Reviewer for the following conferences:

- IEEE International Conference on Robotics and Automation (ICRA) 2018-2021
- ACM Multimedia Conference (ACM-MM) 2018-2021
- IEEE/CVF International Conference on Computer Vision and Pattern Recognition (CVPR) 2019-2021
- IEEE/RSJ International Conference on Intelligent Robots and Systems (IROS) 2019-2021
- IEEE International Conference on Computer Vision (ICCV) 2019-2021
- Annual Conference on Neural Information Processing Systems (NeurIPS) 2019-2021
- AAAI Conference on Artificial Intelligence (AAAI) 2020-2021
- International Conference on Pattern Recognition (ICPR) 2020
- European Conference on Computer Vision (ECCV) 2020

- Asian Computer Vision Conference (ACCV) 2020
- German Conference on Pattern Recognition (GCPR) 2020
- Winter Conference on Applications of Computer Vision (WACV) 2021

Student Volunteer for:

- IEEE International Conference on Computer Vision (ICCV) 2017

Invited Talks

Compositional Zero-Shot Learning

2D3DAI, April 2021.

Skills

Languages

- Italian (mother tongue)
- English (professional proficiency)

Programming

- Proficiency with: Caffe, Python, PyTorch
- Experience with: Android SDK, C++, Java, Keras, MATLAB, OpenGL, Prolog

Tübingen (Germany), June 2021