Davide **Talon**

POSTDOCTORAL RESEARCHER IN COMPUTER VISION

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Relevant Working Experiences

Fondazione Bruno Kessler POSTDOCTORAL RESEARCHER

Apr 2024 - Today │ *Trento, IT*

Deep Visual Learning (DVL) unit under the supervision of Elisa Ricci and Yiming Wang. Research on efficient Vision Language Models (VLMs), especially in the fashion domain.

Fondazione Bruno Kessler COLLABORATOR

Jan 2024 - Feb 2024 │ *Trento, IT*

Research on Causal Representation Learning (CRL) and Large Multimodal Models (LMMs).

Charanga Ltd SOFTWARE DEVELOPER INTERN

June 2012 │ *Brighton, UK*

Initial prototype development of the Digital Assets Management System of the company (Ruby on Rails, SQLite).

Education

Nov 2020 - Mar 2024 │ **PhD Student** │ *Istituto Italiano di Tecnologia (IIT)*

PhD at University of Genova.
Pattern Analysis and Computer Vision Group, advised by Dr. Alessio del Bue and Dr. Stuart James. Working on representation learning for causality and disentanglement in visual data. Thesis: "Structured Representation Learning for Visual Data"

Jan 2023 - June 2023 │ **Visiting student** │ *INDELab - University of Amsterdam (UvA)*

Working with Prof. Sara Magliacane on efficient adaptatation of Causal Representations for new unseen environments.

2017 - 2020 │ **M.S. Computer Engineering** │ *University of Padova*, 110 *cum laude*

Thesis: "Contextual Multi-task Learning via Regularization",
Advisor: Alessandro Chiuso.
Coursework: Data structures and Algorithms, Advanced Algorithms, Big Data Computing, Parallel Computing, Machine Learning, Computational Neuroscience, Operations Research, Intelligent Systems [Github], Human Data Analytics [Github].

2013 - 2017 │ **B.S. Information Engineering** │ *University of Padova*, 103/110

Thesis: "Experimental study of adaptive video streaming algorithms",
Advisor: Andrea Zanella.

Skills

Computer skills

Over 5000 lines: Python, Java, Matlab. Proficient with Pytorch, Numpy, HPC (PBS, Slurm), Git.

Soft skills

Team working, leadership, open-mindness, self-motivation, self-management, curiosity, problem setting, problem solving, persistence.

Selected projects

Vision-text multimodality

Working on large Vision Language Models (VLMS) for improved image understanding and generalization. We consider different tasks, such as retrieval, VQA and image-to-text generation.

AI for road infrastructures

Task leader for PATTERN EU Project (Project No. 101159751) aiming at developing core components of PATTERN roads monitoring service and their technical integration required for deployment.

Causality and disentanglement

From raw observations understand the underlying concepts and the causal relationships between them. In a second step, build on the modular nature of causal relationships to efficiently adapt to a new setting.

Puzzle Solving

Solving Jigsaw puzzles with a generative approach. Starting from patches, a generative model estimates their global placement. Assignment of pieces to slots is here framed as one-to-one assignment using a differentiable supervised approximation of the Hungarian algorithm.

Publications

Das, D., Talon, D., Wang, Y., Mancini, M., Ricci, E., "One VLM to Keep it Learning: Generation and Balancing for Data-free Continual Visual Question Answering." *IEEE/CVF Winter Conference on Applications of Computer Vision (WACV)*, 2025.

Litrico, M., Talon, D., Battiato, S., Del Bue, A., Giuffrida, M. V., Morerio, P., "Uncertainty-guided Open-Set Source-Free Unsupervised Domain Adaptation with Target-private Class Segregation." *arXiv preprint arXiv:2404.10574*, 2024.

Talon, D., Lippe, P., James, S., Del Bue, A. and Magliacane, S. "Towards the Reusability and Compositionality of Causal Representations." *Conference on Causal Learning and Reasoning (CLeaR)*, 2024.

Maracani, A., Camoriano, R., Maiettini, E., Talon, D., Rosasco, L., & Natale, L. "Key Design Choices in Source-Free Unsupervised Domain Adaptation: An In-depth Empirical Analysis" *arXiv preprint arXiv:2402.16090*, 2024.

Talon, D., Lippe, P., James, S., Del Bue, A. and Magliacane, S. "Towards the Reusability and Compositionality of Causal Representations." *NeurIPS Workshop on Causal Representation Learning*, 2023.

Maracani, A., Camoriano, R., Maiettini, E., Talon, D., Rosasco, L., & Natale, L. "Key Design Choices for Double-Transfer in Source-Free Unsupervised Domain Adaptation." *ECML Workshop on Reliable Multimodal Learning Across Domains*, 2023.

Talon, Davide, Alessio Del Bue, and Stuart James. "GANzzle: Reframing jigsaw puzzle solving as a retrieval task using a generative mental image." *IEEE International Conference on Image Processing (ICIP)*, 2022.

Talon, D., Attanasio, L., Chiariotti, F., Gadaleta, M., Zanella, A., Rossi, M. "Comparing dash adaptation algorithms in a real network environment." *European Wireless*, 2019.

Other activities

- Partecipant of Eastern European Machine Learning Summer School (EEML21) and VISMAC23 Summer school.

- Organizer of GreenFOMO@ECCV24 [Homepage].

- Reviewer for BMVC21, MULA@CVPR22, Pattern Recognition, CRL@UAI22, VISART@ECCV2022, nCSI@NeurIPS22, MULA@CVPR23, AtC@ECMLPKDD23, CRL@NeurIPS23, MULA@CVPR24, ECCV24, IROS24