Riccardo Majellaro

riccardomajellaro@gmail.com | LinkedIn | GitHub | Website

EXPERIENCE

MACHINE LEARNING ENGINEER | DuckDuckGoose
Jun 2024 – Present

- Research on deepfake detection and explainability methods for deep learning models.
- Design and conduct experiments to improve state-of-the-art deepfake detection models.
- Write production-level code to deploy the developed models.

TEACHING ASSISTANT | Leiden University
Feb 2023 - Jul 2023

- MSc course "Reinforcement Learning" taught by Prof. Aske Plaat.
- Correcting and grading assignments. Helping students via email and during workgroup sessions.

PUBLICATIONS

EXPLICITLY DISENTANGLED REPRESENTATIONS IN OBJECT-CENTRIC LEARNING | Published at TMLR | 2024
Riccardo Majellaro, Jonathan Collu, Aske Plaat, Thomas M. Moerland

SLOT STRUCTURED WORLD MODELS | Preprint | 2024
Jonathan Collu, Riccardo Majellaro, Aske Plaat, Thomas M. Moerland

PROJECTS

INTERACTION INFORMATION OPTIMIZATION FOR OBJECT-CENTRIC REPRESENTATION LEARNING | Report

- Generalized the objective presented in "Information-Theoretic Segmentation by Inpainting Error Maximization" from 1 to *N* foreground objects and applied it to Slot Attention.

TRASHAWAY ROBOT | Repo

- Trained with deep reinforcement learning a mobile robot to perform the task of "cleaning" a squared environment from cubes, using a camera as its only sensor.
- Successfully deployed the trained agent in the real world (using a PiCar-X). The training was only performed in a CoppeliaSim's simulated environment created by us.

TEXT-TO-IMAGE ADDITIONS/SUBTRACTIONS SOLVER | Repo

- Solution of additions/subtractions between two 3-digit (or less) numbers using recurrent neural networks (RNNs).
- The expression to be solved is represented by a string, while the solution is generated as a series of images.

ADVERSARIAL ATTACKS ON VISION MODELS | Repo

- Adversarial attacks on CNN, Transformer-based, and multimodal models.
- Implemented, experimented, and analyzed both gradient-based and evolutionary strategy methods.

EDUCATION

MSC COMPUTER SCIENCE
Leiden University
Sep 2021 - Jul 2023
Artificial Intelligence track
Graduated Cum Laude

BSC COMPUTER ENGINEERING
University of Modena and Reggio Emilia
Sep 2017 - Oct 2020

SKILLS

PROGRAMMING
Main expertise: Python • C • SQL
Past experience: Java • Javascript • C++

FRAMEWORKS / TOOLS
PyTorch • TensorFlow • PyTorch3D
NumPy • Scikit-learn • Matplotlib
OpenCV • Pandas
Git • Unix shell • Slurm • LaTeX

LANGUAGES
Italian (native) • English (fluent)

RESEARCH INTERESTS

My primary research interests are in machine learning and computer vision, with a focus on representation learning, unsupervised learning, and self-supervised learning. I worked on topics such as object-centric representation learning, unsupervised learning of multi-object 3D scenes from single-view images, and (model-based) reinforcement learning. I am also interested in vision-language models, embodied agents, and external memories for artificial neural networks. Currently working on deepfake detection.

ADDITIONAL PROJECTS

CLASSIC/VISION CARTPOLE WITH DEEP RL | Repo | Repo

UNSUPERVISED ADVERSARIAL LEARNING OF MULTI-OBJECT 3D SCENES FROM SINGLE-VIEW IMAGES | Private Repo