

Jonathan Collu Leiden, The Netherlands

EDUCATION

•Leiden University, Leiden, The Netherlands

Sep 2021 - Jul 2023

MSc Artificial Intelligence (Computer Science)

- -Master's program completed with a GPA of 8.6/10 (Leiden University's GPA statistics)
- -Research thesis on object-centric representation learning applied to model-based reinforcement learning (possible publication on ICLR 2024)

·La Sapienza Universita' di Roma, Rome, Italy

Sep 2017 - Dec 2020

BSc Computer Science

EXPERIENCE

•Leiden University

Feb 2023 – Jul 2023

Teaching Assistant (MSc)

Leiden

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

•Leiden University

Sep 2022 - Jan 2023

Teaching Assistant (MSc)

Leiden

- Teaching assistant for the MSc course "Automated Machine Learning" taught by Prof. Jan Van Rijn
- Correcting and grading assignments and exams. Helping students via email and during workgroup sessions

•Accenture Feb 2021 – Aug 2021

Analyst (internship)

Rome

- Front-end development (JavaScript, Angular, TypeScript)
- Back-end development (Java)
- Database management (PL/SQL)

PERSONAL PROJECTS

•Recognizing Characters in Literary Texts in English and Italian

Aug 2020 - Dec 2020

Experimental Thesis (BSc)

- Extension of BookNLP to process texts in Italian
- Semantic analysis with WordNet and BabelNet to transfer features such as pronominal coreference from English to Italian translations
- Scripts to improve alias recognition through honorifics and hypocorisms

•IIO for Object-Centric Representation Learning 💆 Report

Oct 2022 - Feb 2023

Project conducted during the course: "Seminar in Advanced Deep Reinforcement Learning".

- Extension of the paper "Object-Centric Learning with Slot Attention" by Francesco Locatello et al., specifically on the object discovery task
- Generalization of the objective presented in "Information-Theoretic Segmentation by Inpainting Error Maximization"
- Working on solving the limitation for which Slot Attention typically distributes the background equally over all slots instead of capturing it in just a single slot
- Working on speeding up the training process to allow usage of the algorithm in model-based reinforcement learning

•TrashAway Robot 🗘 <u>Code</u>

May 2022 - Jun 2022

Project conducted during the course: "Robotics".

- 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
- Created with CoppeliaSim the simulated environment used during the training process
- Successfully deployed the trained agent in the real world (using a PiCar-X)

•Classic/Vision CartPole with Deep RL \bigcirc $\underline{Code(DQN)}$, \bigcirc $\underline{Code(policy-based)}$

Mar 2022 - Jun 2022

Projects conducted during the course: "Reinforcement Learning".

- Solved the Cartpole V1 by OpenAI both with classic and vision (images) observation formats
- Implemented, experimented and analyzed Deep Q-Learning and Policy-based methods

PUBLICATIONS

•Slot Structured World Models 2 Paper

Jonathan Collu, Riccardo Majellaro, Aske Plaat, Thomas M. Moerland

- Under review at ICLR 2024

•Explicitly Disentangled Representations in Object-Centric Learning 💆 Paper

Riccardo Majellaro, <u>Jonathan Collu</u>, Aske Plaat, Thomas M. Moerland

- Under review at ICLR 2024

SKILLS

Languages: Italian(native), English(Fluent), Spanish(fair)

Programming Languages: Python, Java, Scala, C, JavaScript, TypeScript, PHP, Bash

Relevant tools: NumPy, PyTorch, TensorFlow, Keras, OpenCV, Scikit-learn, Matplotlib, Weights&Biases, Unix shell,

Slurm, Gym, Pandas, LaTeX

 $\textbf{Databases:}\ \operatorname{PostgreSQL},\ \operatorname{MySQL},\ \operatorname{PL/SQL}$

Soft Skills: ambitious, self-confident, team worker, adaptability, problem-solving