Jonathan Collu
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 GitHub Profile
 LinkedIn Profile
 Website

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 *Code* *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 *Code(DQN)*, *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** 📄 *Paper*

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

– Currently Preprint

•**Explicitly Disentangled Representations in Object-Centric Learning** 📄 *Paper*

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

– Currently Preprint

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
Databases: PostgreSQL, MySQL, PL/SQL
Soft Skills: ambitious, self-confident, team worker, adaptability, problem-solving