Ahmed Hendawy

Ph.D. Student in Reinforcement Learning

ahmed@robot-learning.de
ahmedhendawy.de
ahmed-magdy-hendawy
ahmedmagdyahmed google scholar

About me

I am a third-year PhD. student at the LiteRL and IAS research groups at TU Darmstadt, Germany. My advisors are Prof. Carlo D'Eramo and Prof. Jan Peters. My research delves into the Reinforcement Learning topics of multi-task and continual learning. My research objective is to boost the learning process of agents by leveraging knowledge from multiple tasks learned concurrently or in sequence. I develop RL algorithms that are application agnostic; however, I lean towards robot learning applications.

Education

2022–present **PhD. in Computer Science. Advisor: Carlo D'Eramo & Jan Peters**, *Technical University of Darmstadt*, Darmstadt - Germany.

2019–2021 **M.Sc. in Information Technology**, *University of Stuttgart*, Stuttgart - Germany.
Specialization: *Computer Engineering*, GPA: 1.5/1.0

2021 **Master's Thesis**, *University of Stuttgart & Robert Bosch GmbH*, Stuttgart - Germany.
Title: *Constraint-based Optimization Approach for Generalized Few-Shot Object Detection*, GPA: 1.0/1.0

2014–2019 **B.Sc. in Mechatronics Engineering**, *German University in Cairo*, Cairo - Egypt.
GPA: 0.82/0.7 (A+, Excellent with the Highest Honors), I ranked *second* in my graduation class.

2018 **Bachelor's Thesis**, *Technical University of Munich*, Munich - Germany.
Title: *A Hybrid Approach for Constrained Deep Reinforcement Learning*, GPA: 1.0/1.0

Technical Skills

Programming Python, C++, Java

Frameworks PyTorch, Tensorflow/Keras, JAX (limited), ROS 1/ ROS 2.

Experience

04/2022–present **Researcher**, *Reinforcement Learning*, LiteRL - IAS, TU Darmstadt, Germany.
I research and publish scientific papers in Reinforcement Learning, Teaching, and Mentoring Bachelor and Master students.

11/2021–12/2021 **Graduate Student Researcher**, *Computer Vision*, Robert Bosch GmbH, Germany.
I worked on writing down my master's thesis contribution as a research paper.

11/2020–04/2021 **Research Intern**, *Computer Vision*, Robert Bosch GmbH, Germany.
I investigated how to improve the existing Few-Shot Object Detection algorithms, in addition to building a reliable codebase that was used later for my thesis.

04/2020–10/2020 **Graduate Student Researcher**, *Machine Learning*, Fraunhofer IPA, Germany.
I proposed a deep learning approach for *Material Identification* by denoising Radar raw signals using a *Wavenet* network.

04/2020–07/2020 **Graduate Student Researcher**, *Software Engineering*, Institute of System Dynamics, University of Stuttgart, Germany.
I worked on developing a Python library to wrap the linear optimization algorithms written in Julia (PyLinear-Solver).

09/2019–11/2019 **Developer Advocate**, *Software Engineering*, Avelabs, Egypt.
I developed ADAS/AI applications for autonomous driving in general, perception systems, in particular, using the company's product "*Yonohub*" which is a cloud-based system for designing, sharing, and evaluating complex systems, such as Autonomous Vehicles, ADAS, and Robotics. In addition, I have written blog posts on Medium to advocate for the product.

06/2019–09/2019 **Developer Advocate Intern**, *Software Engineering*, Avelabs, Egypt.
I developed a benchmarking platform using Yonohub to benchmark multi-object tracking algorithms (e.g. AB3DMOT) against the nuScenes dataset.

Publications

Conference Papers

2024 **Ahmed Hendawy**, Jan Peters, and Carlo D'Eramo. Multi-Task Reinforcement Learning with Mixture of Orthogonal Experts. *International Conference on Learning Representations (ICLR)*, 2024.

2023 Karim Guirguis, Mohamed Abdelsamad, George Eskandar, **Ahmed Hendawy**, Matthias Kayser, Bin Yang, and Juergen Beyerer. Towards Discriminative and Transferable One-Stage Few-Shot Object Detectors. *Winter Conference on Applications of Computer Vision (WACV)*, 2023.

Workshop Papers

2023 Marcel Mittenbuehler, **Ahmed Hendawy**, Carlo D'Eramo, and Georgia Chalvatzaki. Parameter-efficient Tuning of Pretrained Visual-Language Models in Multitask Robot Learning. *In CoRL Workshop on Learning Effective Abstractions for Planning (LEAP)*, 2023.

2023 Henrik Metternich, **Ahmed Hendawy**, Pascal Klink, Jan Peters, and Carlo D'Eramo. Using Proto-Value Functions for Curriculum Generation in Goal-Conditioned RL. *In NeurIPS Workshop on Goal-Conditioned Reinforcement Learning*, 2023.

2022 Karim Guirguis, **Ahmed Hendawy**, George Eskandar, Mohamed Abdelsamad, Matthias Kayser, and Jürgen Beyerer. CFA: Constraint-based finetuning approach for generalized few-shot object detection. *In CVPR Workshop on Learning with Limited Labelled Data for Image and Video Understanding (L3D-IVU)*, 2022.

Preprints

2025 **Ahmed Hendawy**, Gabriele Tiboni, Jan Peters, and Carlo D'Eramo. It is All Connected: Multi-Task Reinforcement Learning via Mode Connectivity. *under review*.

2024 Joe Watson, Chen Song, Oliver Weeger, Theo Gruner, An T. Le, Kay Hansel, **Ahmed Hendawy** et al. Machine Learning with Physics Knowledge for Prediction: A Survey. *arXiv preprint arXiv:2408.09840*, 2024.

Honors & Awards

2022 **Best Paper Runner-up Award at the CVPR 2022 Workshop on Learning with Limited Labeled Data for Image and Video Understanding**.
Paper title: CFA: Constraint-based Finetuning Approach for Generalized Few-Shot Object Detection

2022 **Sony Graduate Award for Best Master's Thesis**.
Thesis title: Constraint-based Optimization Approach for Generalized Few-Shot Object Detection

2020-2021 **The Deutschlandstipendium (DStip) Scholarship at the University of Stuttgart**.
Half of the funding of the D-Stips comes from the Federal Ministry of Education and Research (BMBF), the other half is from private donors, STIHL Germany.

2014-2019 **Full Scholarship for Bachelor of Science in Mechatronics Engineering at the German University in Cairo**.
I ranked second in the Suez governorate during high school, which was encouraging for the German University in Cairo to offer me a full scholarship for a Bachelor degree in Engineering at the university.

2019 **1st Place of the Technical Innovation Award in Shell Eco-Marathon Asia 2019**.
I led an R&D team that developed a system for vehicle drivers with physical limitations (such as missing arms or legs) using a drive-by-wire system that is controlled via brainwave and facial sensors.

2018 **Scholarship for Bachelor Thesis at The Technical University in Munich**.
I was awarded a scholarship by the German University in Cairo to conduct my Bachelor Thesis at the Technical University in Munich due to my academic performance (Ranked 2nd among 251 students in the class of Mechatronics Engineering).

2018 **2nd Place of the safety award in Shell Eco-Marathon Asia 2018**.
Using heart rate sensors, face recognition, rain sensors, and other critical sensors inside the car to develop a safety system for the driver and the vehicle.

2018 **1st place at the *iCompete* Competition of iHub at Ain Shams University**.
An AGV Robot, called Solar Nanny, was designed, manufactured, and controlled to dry clean the surface of solar panels in industrial fields.

Invited Talks

2024 **Multi-Task Reinforcement Learning with Mixture of Orthogonal Experts**, *Mate Podcast*.

2024 **Introduction to Reinforcement Learning**, *To Data and Beyond Podcast*, In Arabic.

Student Supervision

2024 **Marcel Mittenbühler**, *Parameter-Efficient Tuning of Pretrained Visual-Language Models in Multitask Robot Learning*, Master Thesis.

2024 **Lorenzo Tozzi**, *Dynamic Tiles for Deep Reinforcement Learning*, Master Thesis.

Teaching Experience

2023 **Head of Teaching Assistants**, *Reinforcement Learning: From Fundamentals to the Deep Approaches*, Summer Semester, TU-Darmstadt, Germany.

2022 **Teaching Assistant**, *Reinforcement Learning: From Fundamentals to the Deep Approaches*, Summer Semester, TU-Darmstadt, Germany.

Organization & Reviewing Activities

Workshop Organization

07/2024 **International Workshop of Intelligent Autonomous Learning Systems (IWIALS)**.
Kleinwalsertal, Austria

12/2023 **1st Symposium On Lifelong Explainable Robot Learning (SYMPLER)**.
Nürnberg, Germany

Reviewing

Conferences International Conference on Machine Learning (ICML), International Conference in Learning Representation (ICLR), Conference on Neural Information Processing Systems (Neurips), Reinforcement Learning Conference (RLC), Conference on Robot Learning (CoRL), Artificial Intelligence and Statistics (AISTATS) (**Top Reviewer**)

Workshops European Workshop on Reinforcement Learning (EWRL)

Open-Source Software

MOORE, *Multi-Task Reinforcement Learning with Mixture of Orthogonal Experts*.
GitHub: `https://github.com/AhmedMagdyHendawy/MOORE`

Extracurricular Activity

2019 **R&D Team Lead**, *Shell Eco-Marathon GUC Team (GUC Innovators)*.

2018 **Project Manager of Dashboard and Accessories**, *Shell Eco-Marathon GUC Team (GUC Innovators)*.

2017 **Motor Control Team Member**, *Shell Eco-Marathon GUC Team (GUC Innovators)*.

Languages

Arabic Native

English Fluent (B2)

German Basic (A1)