AHMED M. HENDAWY

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EDUCATION

Ph.D. in Computer Science, TU Darmstadt *Apr. '22 - Present*
- Pursuing a Ph.D. at the LiteRL and IAS research groups at TU Darmstadt.

M.Sc. in Information Technology, University of Stuttgart *Dec. '19 - Nov. '21*
- Specialization: Computer Software/ Hardware Engineering
- GPA: 1.5

Master's Thesis, University of Stuttgart, Germany *May. '21 - Nov. '21*
- Robert Bosch GmbH
- Thesis title: "Constraint-based Optimization Approach for Generalized Few-Shot Object Detection"

B.Sc. in Mechatronics Engineering, German University in Cairo *Oct. '14 - Jul. '19*
- GPA: 0.82 (A+, Excellent with the Highest Honours)
- Ranked 2^{nd} among 251 students in the class of Mechatronics Engineering '19

Bachelor's Thesis, Technical University of Munich, Germany *Mar. '18 - Jul. '18*
- Chair of Automatic Control Engineering (LSR).
- Thesis title: "A Hybrid Approach for Constrained Deep Reinforcement Learning"
- Grade: 0.7 (A+)

TECHNICAL SKILLS

Programming Skills	Python, C++/ C, Java, VHDL, julia (limited).
Frameworks	PyTorch, Tensorflow/ Keras, OpenCV, ROS 1/ ROS 2.
Languages	Arabic (Native), English (B2), German (A2), French (A1)

EMPLOYMENT AND INTERNSHIPS

TU Darmstadt Apr. '22 - Present
Ph.D. Candidate

- Ph.D. candidate at the newly founded research group LiteRL supervised by Dr. Carlo D'Eramo and co-supervised by Prof. Jan Peters, head of the Intelligent Autonomous System (IAS) group.

TU Darmstadt Apr. '22 - Sep. '23
Teaching Assistant

- Teaching Assistant for the Reinforcement Learning course at TU Darmstadt for the summer semester of 2022 and 2023.

Robert Bosch GmbH Nov. '21 - Dec. '21
Working Student

- Writing a research paper submitted at CVPR main conference.

Robert Bosch GmbH May. '21 - Nov. '21
Master Thesis Student

- Developing a constraint-based method inspired by the continual learning literature for the Generalized Few-Shot Object Detection problem.

Robert Bosch GmbH Nov. '20 - Apr. '21
Research and Development Intern

- Investigating and enhancing the existing Few-Shot Object Detection framework.

Fraunhofer IPA Apr. '20 - Oct. '20
Working Student

- Material Identification using Radar-based deep learnning approaches

Institute of System Dynamics, University of Stuttgart Apr. '20 - Jul. '20
Working Student

- Developing a linear optimization framework using Python and Julia (PyLinearSolver).
- Motion Planning for manipulation tasks of a multi-robot system

Machine Learning and Robotics Lab, University of Stuttgart Dec. '19 - Mar. '20
Working Student

- Data analysis of the motion planning problem for a multi-robot system of a BUGA construction project using the Logic Geometric Programming (LGP) optimization framework (introduced by Prof. Marc Toussaint).
- Developing a deep learning algorithm to perform high-level actions instead of the existed decision tree algorithm.

Avelabs, Egypt Sep. '19 - Nov. '19
Yonohub Developer Advocate

- 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.

Avelabs, Egypt Jun. '19 - Sep. '19
Yonohub Developer Advocate Intern

- Developing Machine Learning applications for autonomous driving and robotic systems.

German University in Cairo Sep. '18 - Dec. '18
Junior Teaching Assistant

- Teaching a CAD design course for engineering students to master AutoCad and SolidWorks softwares.

Chair of Automatic Control, Technical University in Munich Jul. '18 - Aug. '18
Undergraduate Working Student

- Transfer Learning between two trained Deep Reinforcement Learning policies for two different humanoid models (simple and complex Atlas robot) to decrease the modeling mismatch.

Multi Robotic Systems (MRS) Lab, German University in Cairo Sep. '16 - Sep. '16
Undergraduate Research Assistant

- Learning the techniques for PCB design and applying them to robot applications.

ARAtronics Lab, German University in Cairo Aug. '16 - Aug. '16
Undergraduate Research Assistant

- Understanding some knowledge related to optical sensors and using those concepts for integration in some robot systems.

PUBLICATIONS

Conference Papers

- A. Hendawy, J. Peters, and C. D'Eramo. Multi-task reinforcement learning with mixture of orthogonal experts. In *International Conference on Learning Representations (ICLR)*, 2024
- K. Guirguis, M. Abdelsamad, G. Eskandar, A. Hendawy, M. Kayser, B. Yang, and J. Beyerer. Towards discriminative and transferable one-stage few-shot object detectors. In *Winter Conference on Applications of Computer Vision (WACV) 2023*, 2023

Workshop papers

- K. Guirguis, A. Hendawy, G. Eskandar, M. Abdelsamad, M. Kayser, and J. Beyerer. Cfa: Constraint-based finetuning approach for generalized few-shot object detection. *Workshop on Learning with Limited Labelled Data for Image and Video Understanding (L3D-IVU)*, 2022
- M. Mittenbuehler, A. Hendawy, C. D'Eramo, and G. Chalvatzaki. Parameter-efficient tuning of pre-trained visual-language models in multitask robot learning. In *CoRL 2023 Workshop on Learning Effective Abstractions for Planning (LEAP)*, 2023
- H. Metternich, A. Hendawy, P. Klink, J. Peters, and C. D'Eramo. Using proto-value functions for curriculum generation in goal-conditioned rl. In *NeurIPS 2023 Workshop on Goal-Conditioned Reinforcement Learning*, 2023

INVITED TALKS

MOORE at Mate Podcast Feb. '24

- I was invited to the "Mate" Podcast to discuss our ICLR 2024 publication, Multi-Task Reinforcement Learning with Mixture of Orthogonal Experts.

Introduction to RL at To Data and Beyond Podcast Jan. '24

- I was invited to the Egyptian Podcast "To Data and Beyond" to talk about Reinforcement Learning and its practical applications.

TEACHING

Reinforcement Learning, TU Darmstadt Summer Semester '23
Head of Teaching Assistants -

Reinforcement Learning, TU Darmstadt Summer Semester '22
Teaching Assistant -

REVIEWING

Reinforcement Learning Conference (RLC) 2024
Senior Reviewer

- I reviewed 3 reinforcement learning related papers for RLC 2024.

Conference on Robot Learning (CoRL) 2023
Reviewer

- I reviewed 5 robot learning related papers for CoRL 2023.

Artificial Intelligence and Statistics (AISTATS) 2023
Reviewer

- I received the Top Reviewer Award (top 10% of reviewers) at AISTATS 2023.

ORGANIZATION

International Workshop of Intelligent Autonomous Learning Systems (IWIALS) Jul. '24

1st Symposium On Lifelong Explainable Robot Learning (SYMPLER) Dec. '23

HONOURS AND AWARDS

The Deutschlandstipendium (DStip) at the University of Stuttgart Apr. '20 - Mar. '21

· 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.

Full Scholarship for Bachelor of Science in Mechatronics Engineering Oct. '14 - Jul. '19

· Ranked 2nd in the Suez government during the high school study which was encouraging for the German University in Cairo to offer me a full scholarship for a Bachelor degree in Engineering at the university.

1st Place of the Technical Innovation Award in Shell Eco-Marathon Asia 2019 May. '19

· 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.

Scholarship for Bachelor Thesis at The Technical University in Munich Mar. '18 - Jul. '18

· The German University in Cairo awarded me a scholarship to conduct my Bachelor Thesis at the Technical University in Munich due to my academic performance "2nd rank among 251 students in the class of Mechatronics Engineering".

2nd Place of the safety award in Shell Eco-Marathon Asia 2018 Mar. '18

· 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.

1st place in "iCompete" Competition, iHub, Ain Shams University Jun. '17

· An AGV Robot, called Solar Nanny, was designed, manufactured, and controlled to dry clean the surface of solar panels in industrial fields.

PROJECTS

Constraint-based Optimization Approach for Generalized Few-Shot Object Detection (Robert Bosch GmbH) 2021 - Present

· Proposing a new few-shot object detection algorithm to achieve high peformance on the few-shot learning task while alleviating the forgetting on the previously learned classes.

Few-Shots Object Detection (Robert Bosch GmbH) 2020 - 2021

· Investigating and enhancing object detection algorithm to achieve high performance on many well-know datasets given only few examples of each class.

Material Identification using MIMO Radars in Non-contact Dynamical Environments (Fraunhofer IPA) 2020-2021

· Adapting WaveNet (a generative model for raw audio) for Radar denoising to facilitate the classification task.

PyLinearSolver: Python Interface for Well-known linear solvers packages (institute of System Dynamics) 2020

· Creating a PyPI package to wrap many well-known linear solvers written in different languages (Author and Maintainer of the library).

Benchmarking Platform for Multi-Object Tracking Algorithms against nuScenes 2019

· Developing a benchmarking platform using Yonohub to benchmark multi-object tracking (e.g. AB3DMOT) algorithms against the nuScenes dataset.

Demonstration of a cooperative real-life scenario on a hybrid-controlled vehicle platoon model 2019

· Multiple simulation of different real-life scenarios for platoon of vehicles.

Non-Linear Controlled Vehicle Platoon Model 2019

· Developing a non-linear controller (Backstepping, MPC, and SMC) on a vehicle platoon model.

Cleo Smart Safety System (SEM'18 in Singapore and SEM'19 in Malaysia) 2018 - 2019

· Building an ADAS system for road safety requirements satisfaction, implemented in ROS1 with YOLOV3 for object detection and depth estimation using a monocular camera.

Cleo Innovative Driving Method for Disabled People (SEM'19 in Malaysia) 2019

· Developing a translated brain command for driving an electric vehicle, using a brain-wave sensor.

A Hybrid Approach for Constrained Deep Reinforcement Learning – (Thesis Topic) 2018

· Constraining the learning process of an autonomous agent to satisfy safety aspects in real-life applications to have a collision-free during learning.

"Solar Nanny" Photo-voltaic PV Cleaning Robot 2017

· Developing two versions of a PV cleaning robot, AGV for small PVs and large robot system for industrial farms.

EXTRA ACTIVITIES

Machine Learning Community, German University in Cairo Feb. '19 - Nov. '19

· Instructor and Mentor

Shell Eco-Marathon GUC Team (GUC Innovators) Jul. '16 - Nov. '19

· Team Lead of Research and Development R&D
· Project Manager of Dashboard and Accessories
· Motor Control Team Member