

# AHMED M. HENDAWY

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## EDUCATION

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**PhD in Computer Science, TU Darmstadt** *Apr. '19 - Present*

- Pursuing a PhD at the LiteRL and IAS research groups at TU Darmstadt.

**M.Sc. in Information Technology (INFOTECH), 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<sup>nd</sup> 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

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<b>Programming Skills</b>	Python, C++/ C, Java, VHDL, julia (limited).
<b>Frameworks</b>	PyTorch, Tensorflow/ Keras, OpenCV, ROS 1/ ROS 2.
<b>Datasets</b>	COCO, PASCAL VOC, TLess, ImageNet, nuScenes, KITTI, Lyft.
<b>Softwares/ Simulators</b>	SUMO, MATLAB/SIMULINK, Mathematica.
<b>Languages</b>	Arabic (Native), English (B2), German (A2), French (A1)

## EMPLOYMENT AND INTERNSHIPS

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**LiteRL, IAS, TU Darmstadt** *Apr. '21 - 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.

**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 learning 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

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· K. Guirguis, **Hendawy, A.**, 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

## HONOURS AND AWARDS

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**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 2<sup>nd</sup> 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.

**1<sup>st</sup> 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 "2<sup>nd</sup> rank among 251 students in the class of Mechatronics Engineering".

**2<sup>nd</sup> 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.

**1<sup>st</sup> 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

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**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 performance 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-known 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

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**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

## RECOMMENDATIONS

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- M.Sc. -Ing. Karim Guirguis, Ph.D. Candidate at BOSCH (CR/APA2). (Email: karim.guirguis@de.bosch.com)
- Dr. -Ing. Ozgur S. Oguz, Postdoc at the Learning and Intelligent System Lab TU Berlin. (Email: ozgur.oguz@ipvs.uni-stuttgart.de)