

AHMAD HASSANEIN

ROBOTICS ENGINEER



Top Skills:

Quadrotor control, Computer vision, Deep and reinforcement learning, Mobile Robots

CONTACT

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Chemnitz, Germany

TOP PROJECTS

[Master thesis: A novel approach for visual autonomous navigation in mobile robots.](#)



Master Grade: 1.3 (German)

[Bachelor thesis: Development of a particle filter algorithm for state estimation for a virtual musical conductor](#)



Bachelor's Thesis Grade: 1.3 (German)

[Development of an MPC \(Model Predictive Controller\) for a quadrotor to achieve fault tolerance.](#)



Project grade: 1.3 (German)

EDUCATION

2021-2025

Chemnitz University of Technology, Germany

Master's Degree in Neurorobotics. (German Grade: 1.8)

Course content:

- Reinforcement Learning and Deep Learning
- Computer vision
- Automation
- Mobile and industrial robotics



TECHNISCHE UNIVERSITÄT
CHEMNITZ

Master's thesis:

Development of a novel approach for visual autonomous navigation in mobile robots. The aim of this project was to develop a bio-inspired visual navigation method as an alternative to conventional V-SLAM methods. It was inspired by models of the insect brain models of the optical lobe of the fruit fly and the central complex of the sweat bee.

Further projects:

- Development of an MPC (Model Predictive Controller) for a CrazyFlie 2.0 quadcopter to achieve fault tolerance. With this controller, the drone was able to stay in the air despite two damaged rotors. Simulation was done in PyBullet.
- Implementation of a vision-based, self-driving end-to-end learning method (like Nvidia's DAVE2), trained with behavioural cloning. Extensive experience with data augmentation was gained to build the training dataset.
- Autonomous grasping on a (Simulated) Kinova Gen2 Robot arm with deep learning in PyBullet

2016-2021

The German University in Cairo, Egypt

Bachelor's degree programme in Mechatronics. (German Grade: 1.7)

Course content:

- Control theory
- Sensors
- Electronics
- Robotics
- Mathematics
- Physics
- Mechanics



Exchange Semester 2020

Hochschule Heilbronn, Germany

Bachelor-Thesis:

Development of a particle filter algorithm for state estimation for a virtual musical conductor using a micro radar sensor.

Robotics Project:

Built a UGV from scratch, with a Raspberry and an Arduino, DC motors, and a 6-axis IMU, encoders and a webcam. The UGV was controlled with ROS and was able to successfully follow a square path. In addition, the robot was able to use the camera and OpenCV on Python to locate a red target in the vicinity, drive towards it autonomously and stop at a predefined distance in front of the red object.

Further Projects:

- Development of a PID-controlled mobile robot that can follow a laser point.
- Development of a bottle sorting machine with an FPGA (Xilinx)
- Collaboration in the development of a rescue robot. Wrote the code for the remote control on Android (Java). The robot was controlled with TCP via WLAN.

LANGUAGES

German: C1 (TestDaf), English: C1 (IELTS), Arabic (Native)

PROGRAMMING LANGUAGES

Python, C, C++, Java, MATLAB

AI THEORY

Deep learning, CNNs, YOLO, RNNs, Data augmentation, Object Detection, LLMs, Transformers, Reinforcement learning and Optimal Control, Deep Q-Networks, Autonomous Systems

ELECTRONICS AND MECHANICS

FPGA, Fluid Mechanics, Industrial Automation

STATE ESTIMATION AND NAVIGATION

SLAM, Sensor Fusion, Particle Filter, Kalman Filter

CONTROL THEORY

Non-Linear Control, PID Control

SIMULATION

Gazebo, PyBullet, Mujoco

TOOLS

Linux, Docker, Simulink, ROS2, Git, Solidworks, AutoCad, Tensorflow, OpenCV ,Numpy, Padas, PyTorch, Stable Baselines 3

NEUROROBOTICS

Neurocognition, Spiking Neural Networks

ROBOTS

Franka Emika 3, Kinova Gen 2, TurtleBot3

OTHER ACHIEVEMENTS

Since 2022

Renato Germano Sports Club (Brazilian Jiu Jitsu)

- Active Member
- Participated in competitions

2023

Dresden Full Marathon 2023

- Ran a full marathon