

Mostafa Mohamed Abdelaziz

Mechatronics Engineer

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in Mostafa Abdelaziz

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🇪🇬 Egyptian



05/02/2004



Cairo, Egypt

PROFILE

Robotics and embedded systems engineer. ROS2, computer vision, sensor fusion, and edge AI on Jetson and STM32. Final year Mechatronics Engineering at the German University in Cairo, ranked 3rd by cumulative GPA. Bachelor's thesis graded 1.0 (A) at the University of Stuttgart, Institute of Flight Mechanics and Controls.

EDUCATION

University of Stuttgart 🔗

Faculty of Aerospace Engineering and Geodesy

Institute of Flight Mechanics and Controls (iFR), FRPG

o Bachelor Thesis, graded 1.0 (A): "Extending a TCN-Based Blimp Motion Predictor to Versatile Vehicle and Flight Conditions"

03/2026 - 07/2026
Stuttgart, Germany

German University in Cairo (GUC)

Faculty of Engineering and Materials Science (EMS)

Major: Mechatronics Engineering

o Cumulative GPA: 0.93 (equivalent to 4.0)

o Ranked 3rd based on cumulative GPA 🔗

09/2022 - 07/2027
Cairo, Egypt

German International University in BERLIN (GIU Berlin)

Faculty of Engineering and Materials Science (EMS)

o 4th Semester

o Awarded a DAAD Scholarship due to academic excellence. (Semester abroad)

12/2023 - 06/2024
Berlin, Germany

Embedded Systems Diploma, 🔗

Association Of Management and Information Technology (AMIT)

10/2023 - 03/2024
Cairo, Egypt

Futures Language School,

Graduated with a 97.1% in the Math section, ranked 1st in my school.

2008 - 2022
Cairo, Egypt

EXPERIENCE

Robotics and AI Werkstudent, **Lucas-Nülle GmbH**

Product Management Energy & Industry

o Built a ROS2 robot arm demonstrator on Jetson Orin Nano: depth camera scans the workspace into a live 3D model in RViz

o Developed a drone flight simulator (ArduPilot SITL, Webots, AirSim) with 20 fault-injection training scenarios

05/2026 - 08/2026
Cologne, Germany

Embedded Systems Intern, **Valeo Egypt** 🔗

Worked on system testing for embedded automotive projects; developed an automated test management tool that increased test throughput by over 200%, significantly accelerating the testing process.

07/2025 - 09/2025
Cairo, Egypt

DAAD-Funded Exchange Workshop, University of Stuttgart [↗](#)

Institut für Automatisierungstechnik und Softwaresysteme (IAS).

Represented the German University in Cairo (GUC) at the workshop "Cooperation of Heterogeneous Agents in Industrial Applications".

Focused on integrating TurtleBot 3, Unitree GO1, and Franka Emika Panda robots.

Specialized in ROS, Gazebo & navigation of Unitree GO1

11/2024

Stuttgart, Germany

Mechatronics Research Intern, German University In Cairo (GUC).

Multi-Robot Systems (MRS) Research Group.

Developed a quadcopter utilizing STM32, incorporating PID control.

08/2024

Cairo, Egypt

PROJECTS

BLIMP MOTION PREDICTION MODEL (BACHELOR THESIS, GRADED 1.0 A): [↗](#)

- Built a physics-residual temporal convolutional network for aerial vehicle motion prediction, 7.3x lower MSE than iTransformer, PatchTST and LSTM baselines.
- Cut recursive rollout error by 85%, against a published benchmark of 53%.
- Deployed at 44.6 ms per prediction on Raspberry Pi (about 22 Hz), 76x GPU speedup with a custom Triton kernel.

VISION-GUIDED BALL BALANCING PLATFORM — STM32, OpenCV, YOLO, JavaFX [↗](#)

- Built a real-time 2-DOF ball-balancing system with STM32 and FreeRTOS.
- Implemented OpenCV for ball & laser tracking and applied PID/LQR for motion control.
- Added UART & TCP-IP communication and a JavaFX GUI.
- Upgraded to YOLOv8-nano with a Kalman filter for improved tracking.

AUTONOMOUS PATH PLANNING FOR UNITREE GO1 (STUTTGART WORKSHOP) [↗](#)

- Implemented an APF-based path planning algorithm for the Unitree Go1 quadruped robot using ROS, Gazebo, and Python. Enabled real-time navigation, obstacle avoidance, and trajectory tracking. Presented outcomes to academic and industry experts.

QUADCOPTER (DRONE) [↗](#)

- Designed an STM32-based quadcopter with PID stabilization, sensor fusion, and WiFi control.
- Developed a Java GUI for real-time monitoring.

SMART TRAFFIC SYSTEM [↗](#)

- Designed a fully functional traffic management system using VHDL on the Basys3 FPGA board.

SMART GLOVE FOR DEAF [↗](#)

- Designed a wearable smart glove using Atmega32 to translate hand gestures into digital outputs.

DICE REALMS: GAME USING JAVA

- Led a 6-member team to develop a GUI strategy game with multiplayer and single-player modes against our developed AI-powered opponent.
- Our AI player ranked 1st in a university-level virtual tournament among 10 teams.

ADVANCED ENCRYPTION STANDARD (AES) USING ASSEMBLY 8086 [↗](#)

- Team Leader

Led a team of 3 members to design and implement the AES Encryption Algorithm using Assembly.

ATTENDANCE MANAGEMENT SYSTEM

• Built a scalable attendance system tailored for training centers and academic institutions using Java, MySQL, Database

TECHNICAL SKILLS

Programming: Python, C++, Embedded C, MATLAB, Java, VHDL

Machine Learning: PyTorch, temporal convolutional networks, transformers, YOLO (custom training), model optimization, Bayesian hyperparameter optimization

Robotics & Simulation: ROS2, Gazebo, RViz, ArduPilot SITL, Webots, AirSim, autonomous navigation, path planning, obstacle avoidance

Embedded & Edge AI: NVIDIA Jetson (Orin Nano, CUDA), Raspberry Pi, STM32, ESP32, ARM Cortex-M, FreeRTOS, Linux device tree and kernel modules

Perception & Control: OpenCV, depth cameras, point clouds, photogrammetry, EKF sensor fusion, GNSS/RTK, IMU, PID/LQR

Computer Vision & Interfaces: OpenCV, image tracking, YOLO (custom model training), JavaFX GUI

Mechanical Design: SolidWorks, power transmission, CNC, 3D printing

ACADEMIC AWARDS

DAAD Scholarship Award

Received the competitive DAAD scholarship, administered by Ulm University, for outstanding academic performance as a **top-ranked Mechatronics Engineering student** at The German University in Cairo (GUC), Faculty of Engineering and Material Science.

EXTRACURRICULAR ACTIVITIES

Embedded Systems Instructor, IEEE GUC club

Conducted workshops and training sessions to teach engineering students the fundamentals and advanced topics in embedded systems.

LANGUAGES

• Arabic
Nativ

• English
Fluent (C2)

• German
Intermediate (A2)