Ahmed Fathy Abdelkhalek

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Experience

The German University in Cairo
Design and Production Teaching Assistant
Sep 2024 - Jul 2025
Cairo, Egypt
- Instructed over 300 students in several courses including Advanced CNC, Industrial Automation, CAD/CAM, Material Removal, Electric Circuits II, and Production Technology.
- Assisted in the preparation of course content, quizzes, midterms and final exams for the aforementioned courses.

University of Stuttgart
GUC-IAS Workshop: Cooperation of Heterogenous Agents in Industrial Application
Nov 2024 - Nov 2024
Stuttgart, Germany
- Worked on integrating three robots—a TurtleBot, a Unitree Go1, and a Franka Emika Panda—for seamless collaborative operations when performing sequential object handovers.
- Lead the Unitree Go1 team throughout the workshop, guiding, coaching, and directing team members to help achieve impressive results and boost team morale.

Smart Systems
Mechatronics Technical Engineer, KUKA Department
Jul 2024 - Sep 2024
Cairo, Egypt
- Created smart and automated solutions for clients to perform a wide variety of applications using KUKA robots and their simulation platform, KUKA.Sim.
- Implemented over a dozen designs for various projects, including robotic cells, calibration tools, and robot welding tables.

JetSolar
Design and Manufacturing Engineer
Oct 2023 - Apr 2024
Giza, Egypt
- Engineered and produced Egypt's first solar-powered PWRPOD, enhancing public workspaces with dedicated features for remote work and charging stations for e-scooters and e-bikes, boosting urban mobility efficiency.

Education

The German University in Cairo
MSc in Engineering and Material Science, Mechatronics Department
Feb 2024 - Sep 2025

The German University in Cairo
BSc in Engineering and Material Science, Mechatronics Department
Sep 2018 - Jun 2023

Skills

CAD: SolidWorks, AutoCAD, Inventor
Engineering Simulation: Simulink, Simscape Multibody, Gazebo, ANSYS, KUKA.Sim
Programming: MATLAB, Python, ROS, C++, KUKA Robot Language (KRL)
Professional: Documentation, data-driven decision making
Operating Systems: Windows, Linux (Ubuntu & Debian), Raspberry Pi OS
Languages: Arabic (Native), English (Fluent), German (Basic)

Projects

ROS Autonomous Vehicle | *Python, ROS, Gazebo, Linux, SolidWorks, Embedded C*
Feb 2023 - Jun 2023
- Simulated a 1:18 scale vehicle using ROS and Gazebo to perform lane-keeping and lane-switching manoeuvres.
- Modified an off-the-shelf 1:18 scale car with multiple sensors, filters, and communication protocols for precise control and localisation to track a desired trajectory with 2.5% error.

Humanoid Arm | *MATLAB, Simscape Multibody, SolidWorks, Embedded C*
Sep 2022 - Jan 2023
- Developed a comprehensive Simscape Multibody model to simulate and control an enhanced Poppy humanoid arm reducing development time by 30%.
- Manufactured and assembled the arm to improve the lives of individuals with tremors to carry out precise tasks with 98% accuracy.

Delta Robot 3D Printer | *SolidWorks, Electronics, Marlin Firmware, Embedded C*
Jul 2022 - Sep 2022
- Designed a novel Delta robot 3D printer in SolidWorks, employing several principles in robotics and parallel manipulators.
- Manufactured, assembled, and tuned the printer to reach a competitive dimensional accuracy of 0.1 mm with over 2500 printing hours.
- Showcased the printer at the 3rd Annual Mechatronics Robotics Exhibition to introduce and highlight the unique advantages of parallel robotics to students .

Publications

A. Fathy, O. M. Shehata and E. I. Morgan, "Development and Validation of Multi-Model Miniature Delta Robot Platform for Precise Manipulation Tasks," 2025 6th International Conference on Control, Robotics and Intelligent System (CCRIS), Guangzhou, China, 2025

A. Fathy, M. Ashraf and A. El-Badawy, "Computed torque control of a prismatic-input delta parallel robot," 2022 4th Novel Intelligent and Leading Emerging Sciences Conference (NILES), Giza, Egypt, 2022
Received the 3rd Best Paper Award at the conference.

Certifications

SOLIDWORKS Additive Manufacturing Associate | **Dassault Systèmes**	*Jun 2025*
SOLIDWORKS CAD Design Professional | **Dassault Systèmes**	*Apr 2025*
Computer Vision for Engineering and Science Specialization | **Mathworks**	*Jun 2024*
Object Tracking and Motion Detection with Computer Vision | **Mathworks**	*Jun 2024*
Machine Learning for Computer Vision | **Mathworks**	*Jun 2024*