Ahmed Fathy Abdelkhalek

+20 121-098-0505 ahmedfathyabdelkhalek@gmail.com Website LinkedIn

Experience

The German University in Cairo *Sep 2024 - Present*
Design and Production Teaching Assistant *Cairo, Egypt*

- Instructed several courses in the design and production technology department, including Advanced CNC, Industrial Automation, CAD/CAM, and Production Technology.
- Prepared course content, quizzes, midterms and final exams for the aforementioned courses.

University of Stuttgart *Nov 2024 - Nov 2024*
GUC-IAS Workshop: Cooperation of Heterogenous Agents in Industrial Application *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 *Jul 2024 - Sep 2024*
Mechatronics Technical Engineer, KUKA Department *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 several designs for various projects related to the company, including robotic cells, calibration tools, and robot welding tables.
- Instructed several engineers on how to assemble, disassemble, operate, and maintain an industrial-grade 3D printer.

JetSolar *Oct 2023 - Apr 2024*
Design and Manufacturing Engineer *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 *Feb 2024 - Present*
MSc in Engineering and Material Science, Mechatronics Department *Cairo, Egypt*

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

- **Thesis:** "Trajectory Tracking Control of a 3 Degree of Freedom Magnetic Robotic System" | Grade: A (Excellent)

Skills

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

Projects

Smart Home Product Line *Dec 2023 - Jan 2024*

- Designed a product line for Photon Smart, including smart light switches, water and gas leak sensors, and shutter controllers.

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.

Hand Gesture Drone | *Python, SolidWorks, Image Processing, Embedded C* *Sep 2022 - Jan 2023*

- Developed a small-scale helicopter with gesture-based control capabilities and 3 modes of flight using image processing algorithms and showcased the technology at the sensors course exhibition.

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 0.05 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 .

Certifications

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*
State Estimation and Localization for Self-Driving Cars | **University of Toronto** *Nov 2023*
Introduction to Self-Driving Cars | **University of Toronto** *Oct 2023*

Publications

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.

Extracurriculars

IEEE GUC Student Branch *Sep 2022 - Jan 2023*
IoT Instructor *Cairo, Egypt*

- Delivered a comprehensive curriculum on IoT, server-client communication, and Raspberry Pi, fostering hands-on learning experiences and increasing understanding and application of these concepts for 15 undergraduate students.