

AHMED ESSAM

Mechatronics Engineer | R&D | Embedded Systems | Robotics

Cairo, Egypt | WhatsApp: 01144186748 | Calls: 01017022859 | Ahmedbarka193@gmail.com

LinkedIn: [linkedin.com/in/ahmed-essam-481ab2277](https://www.linkedin.com/in/ahmed-essam-481ab2277) | Project Portfolio: [Google Drive](#)

PROFESSIONAL SUMMARY

Mechatronics Engineer with hands-on experience in R&D; product development, embedded systems, robotics, PCB design, technical training, and graduation project support. Experienced in prototyping, PC-to-microcontroller interfaces, sensor integration, GPS-enabled devices, digital fabrication, and practical engineering training. Skilled in Arduino, ESP32, PIC microcontrollers, C/C++, SolidWorks, Fusion 360, PCB design tools, PLC basics, and troubleshooting.

CORE SKILLS

Embedded: C/C++, Embedded C, Arduino, ESP32, PIC Microcontrollers, AVR Basics, RTOS Basics

Electronics & PCB: PCB Design, PCB Fabrication, Altium Designer, Eagle, Proteus, Circuit Testing, Troubleshooting

Mechanical & Fabrication: SolidWorks, Fusion 360, 3D Printing, Laser Cutting, CNC / PCB Milling, Mechanical Prototyping

Automation & Control: PLC Programming, Classic Control, Siemens PLC, SCADA / HMI Basics, PID Control, Sensors, AC Motor Drives

Robotics: Line Follower Robots, RC Robots, Robot Arm Systems, Motor Control, Sensor Integration

PROFESSIONAL EXPERIENCE

MAKERS EGY

01/2026 - Present

R&D Mechatronics Engineer

- Working on R&D development for embedded mechatronics devices related to pulse-generation and signal-based systems.
- Developing pulse control systems using PIC microcontrollers and PC-to-microcontroller interfaces.
- Contributing to fast detection device prototypes for viruses and agricultural pests.
- Integrated GPS functionality into an existing device and supported the transition toward a more digital system architecture.
- Prototyping an electromagnetic field sensing feedback module using ESP32, LED strip indication, and PCB design workflow.

EDU-X Training Solutions

08/2024 - Present

Technical Support Specialist & Instructor

- Delivered technical training and support in robotics, PCB design, embedded systems, and hands-on engineering projects.
- Delivered technical sessions at AUC on PCB design and fabrication.
- Supported students in competitions and educational events, including RC Egypt 2024 with a Smart Home project.
- Mentored major projects including a Smart Medical Bed and a Robot Arm system for product transfer between conveyor belts.

Big Hero Robotics Academy

07/2023 - 07/2024

Technical Support Specialist & Instructor

- Delivered robotics and embedded systems training through project-based learning.
- Supported Line Follower Robot projects using Arduino, PD control, and IR sensor arrays.
- Worked on an RC Minesweeper Robot, contributing to mechanical body design and metal detector circuit design.
- Supported fabrication and prototyping inside Big Hero Robotics Fablab, including DIY CNC machines, 3D printers, laser cutters, and PCB milling machines.

Freelance Mechatronics Engineer

04/2023 - Present

Graduation Project & Technical Support

- Supported graduation and student projects involving embedded systems, control logic, PCB development, mechanical design, and system integration.
- Developed and tested solutions using Arduino, ESP32, sensors, custom electronics, and SolidWorks.
- Provided support in project planning, component selection, circuit design, troubleshooting, and final implementation.
- Installed, configured, maintained, and troubleshot imported sheet-forming machinery in a local chandelier manufacturing workshop.

SELECTED PROJECTS

Solar Panel Cleaning Robot - Graduation Project

- Graduation project: Solar Panel Cleaning Robot designed to clean desert photovoltaic panels from dust.
- Project grade: Excellent.
- Led the mechanical design work and contributed as a key assistant in the electrical subsystem.
- Supported mechanism development, system integration, testing, and prototype refinement.

Plastic Injection Molding System

- Developed a semi-automated plastic injection molding system as part of a graduation project.
- Designed and built the control system using Arduino and a custom PCB board.
- Integrated high-torque stepper motors for precise injection mechanism control.
- Implemented industrial heater control and ON/OFF heater driver for stable melting temperature.

Smart Elevator Project

- Participated in the development of a Smart Elevator project.
- Supported embedded control logic, system testing, troubleshooting, and final prototype readiness.

Smart Home Project

- Developed a Smart Home system including a security module, smart garage, LCD interface, sensors, real-time monitoring, automated control, and safety features.
- Integrated multiple sensors and control modules to improve reliability and user experience.

EDUCATION

Helwan University, Cairo

2019 - 2024

Bachelor of Mechatronics Engineering

- Cumulative grade: Excellent.
- Graduation Project: Solar Panel Cleaning Robot for desert photovoltaic panels - Grade: Excellent.
- Role: Mechanical lead and key electrical subsystem support.

TRAINING & COURSES

Embedded Systems Diploma - Information Technology Institute (ITI)

Dates to be added

Training

- Studied C programming, embedded systems concepts, AVR interfacing, RTOS basics, automotive bus introductions, and testing methods.
- Completed a Smart Home project involving sensors, security, LCD interface, garage automation, and real-time monitoring.

PLC Training - HA Consulting Group

01/2022 - 03/2022

Training

- Completed training in Classic Control, Siemens PLC wiring and programming, factory I/O, sensors, and AC motor drives.
- Studied advanced PLC programming, different PLC languages, SCADA, and HMI systems.

VOLUNTEERING

IEEE Helwan Student Branch

09/2021 - 08/2022

RAS Event Team - Mechanical Manager

- Supervised volunteers, managed event flow, planned RAS activities, and supported participants with session content and materials.
- Developed leadership, time management, and technical communication skills.

ADDITIONAL INFORMATION

Languages: Arabic: Native | English: B1

Military Service: Completed