Mohamed Fawzy Sawy

Mechatronics Engineering
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Objective

Embedded Systems & IoT Engineer with hands-on experience in firmware development, microcontroller programming (ESP32, AVR, PIC), PCB design, and communication protocols (I2C, SPI, UART, MQTT). Skilled in C/C++, hardware–software integration, and developing real-time connected systems. Strong problem-solving background with competitive programming experience (ICPC). Seeking a junior embedded role to contribute to innovative hardware solutions

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Technical Skills

Embedded & Firmware

- C, C++, Embedded C
- Microcontrollers: ESP32, AVR, PIC
- RTOS (basic), Timers, Interrupts
- Drivers Development & HAL
- UART, SPI, I2C, ADC, PWM

IoT & Connectivity

- MQTT, HTTP
- Firebase, Cloud Integration
- Wi-Fi, Bluetooth, SIM800L

Hardware

- PCB Design (EasyEDA)
- Sensors Integration
- Circuit Debugging & Testing

Software Tools

- PlatformIO, Arduino IDE, Proteus
- Eclipse, VS Code
- SolidWorks, AutoCAD

Programming

- Algorithms & Data Structures
- Python
- HTML/CSS/JS

Experience

- **Embedded & IoT Engineer Intern — Lotus Power** **(Sep 2025 – Present | Egypt)**
  - Developed firmware for ESP32 and AVR microcontrollers using C/C++.
  - Built IoT solutions including sensor data acquisition, cloud connectivity, and real-time dashboards.
  - Designed and tested PCB prototypes for embedded projects.
  - Integrated communication protocols (I2C, SPI, UART) with multiple sensors and wireless modules.
  - Performed hardware troubleshooting, debugging, and system optimization.

- **Freelance Embedded & IoT Engineer (Remote)** **(Jan 2024 – Sep 2025)**
  - Delivered embedded and IoT solutions for clients including automation systems and smart devices.
  - Built firmware for ESP32/AVR with real-time data logging and cloud updates.
  - Developed complete prototypes including PCB, firmware, mobile control, and cloud integration.

Projects

• **Safe Heart – IoT-Based Smart Health Monitoring System (In Progress)** :
(**Biomedical-Related Project**)

A wearable biomedical device under development aiming to be a market-ready product.
- Continuously monitors heart rate, SpO2, body temperature, blood pressure, and ECG.
- Sends real-time data to a mobile app via ESP32 and SIM800L, connected to Firebase cloud.
- Emergency system integrated with Google Maps to notify nearest hospital and send alerts.
- Designed for future commercial deployment as a smartwatch-sized health monitor.
- Hardware prototyped with biomedical sensors and OLED display; 3D enclosure modeled in SolidWorks.
- Currently working on system optimization and exploring AI model integration for vital sign analysis.

• **Smart Shopping Car** :
- IoT-enabled shopping cart with dynamic price display and weight measurement.
- Follows the customer using ultrasonic sensors (30 cm distance).
- Mobile app control over Bluetooth.
- Built using ESP32 + multiple sensors + DC motor drivers.

• **Smart Treadmill System** (AVR Boot-Camp):
- Auto-start/stop treadmill using PIR sensor.
- Speed control system + reset function.
- Implemented using AVR + PWM + input capture.

• **Smart Attendance Project** :
- ESP32 + RFID for student check-in.
- Real-time logging into an Excel sheet through cloud sync.
- LED/buzzer feedback for success/fail scans.

Education

Higher Technology Institute — **Mechatronics Engineering** | 2022- 2026.
Major: **Embedded Systems & IOT and Mechanical Design.**
- GPA: A+ (Top-ranked in third academic year).

Courses & trainings

- **Machine Learning Workshop** – Sector B5 (July 2025)
- **Embedded systems Diploma —** Ahmed Abdel-Ghaffar (2024) .
- **Embedded systems Workshop —** D-bugerz (may 2024)
- **Front-End Developar —** Digital Egypt Pioneers (April 2024 | Oct 2024).
- **IOT training —** ITI (2023) .
- **Mechanical at Arab Contractors Company** (2023) .
- **SolidWorks**.

Problem Solving — HackerRank / ICPC

Extracurricular Activities

• **Member – ICPC Problem Solving Community** (2024 – Present)
• **Participant – KICOFe 2025 (King's International Collegiate Olympiad in Informatics – Egypt)**