Yousef Ahmed Gomaa

EMBEDDED SOFTWARE ENGINEER

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Summary

Results-driven **Senior Mechatronics Engineering student** specializing in **Embedded Systems, Microcontrollers, and Real-Time Systems**. Solid hands-on experience in embedded software development, firmware engineering, IoT integration, RTOS, robotics, and control systems. Skilled in C, Embedded C, C++, MCU architectures (AVR, ARM Cortex, ESP32), and communication protocols (UART, SPI, I2C, CAN, MQTT, HTTP). Proven ability in team leadership, technical training, and project delivery within multidisciplinary environments. Continuously developing advanced embedded and automation skills through internships, competitions, and real-world projects.

Experience

Embedded & Robotics Intern at Bedo Company **July 2024**

- Developed, programmed, and tested embedded software for robotics applications using AVR/ARM MCUs.
- Built automation prototypes, integrated sensors and actuators, and validated hardware performance.
- Collaborated with robotics team to design IoT-based control systems.

ITI Scholarship Program **August 2023**

- Intensive hands-on training in AVR microcontrollers, Embedded C, RTOS concepts, and real-time debugging.
- Designed and implemented embedded projects including sensor data acquisition, wireless communication, and control algorithms.

Embedded C Workshop Instructor at Mansoura University **December 2023**

- Delivered workshops on Embedded C programming, microcontroller basics, and peripheral interfacing.
- Guided junior students in coding, circuit simulation (Proteus), and project implementation.

Education

BSc in Mechatronics Engineering (Senior)
Mansoura University, Egypt (Expected 2026)
GPA: 3.8 / 4.0

Technical Skills

- **Programming:** C, Embedded C, C++, Python (Basic)
- **Microcontrollers:** AVR, ARM Cortex-M, ESP32
- **Development Tools:** Arduino IDE, Proteus, EasyEDA, Keil uVision, Git
- **RTOS:** FreeRTOS, Basic scheduling, task management

- **Embedded Protocols:** UART, SPI, I2C, CAN, MQTT, HTTP
- **Embedded Concepts:** MCU Architecture, Interrupts, Timers, GPIO, ADC, PWM, DMA, Memory Mapping, Testing & Validation
- **Robotics:** ROS2 (Robot Operating System), SLAM, Perception for Autonomous Vehicles, Gazebo Simulation, Raspberry Pi integration
- **IoT:** Sensor integration, wireless communication, device networking
- **Control Systems:** PID control (MATLAB/Simulink), real-time control loops, system modeling

Projects

- **Smart Home System** (ATmega32, Arduino UNO):
  Developed a full-featured smart home platform with sensor fusion, automation, and remote monitoring.
  Implemented communication via **MQTT, HTTP** protocols.
- **Firefighting RC Car** (Award-Winning):
  Designed and built an autonomous firefighting robot.
  Best Hardware Circuit Award – IEEE Zagazig Competition (2024)
- **RC Car with Robotic Arm:**
  Built and programmed a multi-axis robotic manipulator mounted on RC vehicle, enabling remote and autonomous tasks.
- **Smart Greenhouse (IoT, ESP32):**
  Automated climate control, soil monitoring, and cloud data integration for smart agriculture applications.
- **Autonomous Vehicle SLAM & Perception:**
  Developed basic mapping and perception pipeline using **ROS2 & Raspberry Pi** for autonomous navigation.
- **Control Projects using MATLAB/Simulink:**
  Modeled and simulated various control systems (PID, state-space, real-time embedded implementation).
  Completed multiple certified projects as part of coursework (certifications from MathWorks).

Volunteer Experience

• Team Leader, Luminous Student Team (October 2024–October 2025)

• Presenter, YLF Business Competition Finalist (September 2024)

• Software Head, Luminous Student Team (December2023 – September2024)

• 2nd Place, Emirates Red Crescent Competitions (High School)

Certifications

https://drive.google.com/drive/folders/1etCjO9YB5-BXUGNsR0LOeBNWaeSZKi4J?usp=sharing