Youssef Ashraf Ahmed

Mechatronics Engineer

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Military Status: Completed (June 2025)

Education

Ain Shams University, Faculty of Engineering **| 2018-2023**

B.Sc. in Mechatronics Engineering CGPA 3.35 (Excellent)

Skills

- **Languages:** Embedded C, C/ C++ Python, MATLAB, Java, JavaScript
- **Microcontrollers:** TIVA C, STM32, ATmega32, NXP Semiconductors
- **Embedded Systems:** RTOS, Driver Development, GPIO, EXTI Peripherals (LCD, Keypad, UART, ADC, SPI)
- **Communication Protocols:** SPI, I2C, UART
- **Software & Tools:** ROS, MATLAB/Simulink, Proteus, Siemens TIA Portal, Git
- **Hardware:** Raspberry Pi, Arduino, PLC, Pneumatic Control Systems
- **Soft Skills:** Problem-Solving, Teamwork, Communication, Project Management

Experience

Application Design Engineer | Schneider Electric EECE **Aug 2025 - Present**

Teaching Assistant | Ain Shams University **2025-Present**

Projects

Graduation Project: EVCC (Electric Vehicle Charge Controller) Sponsored by EJAD | Grade: A+

An embedded system for electric vehicles that manages AC/DC charging, estimates battery states, and enables ISO 15118-based Vehicle-to-Grid (V2G) communication with a 48V lithium battery.

- Designed and validated State of Charge (SOC) and State of Health (SOH) estimation algorithms in MATLAB/Simulink using Extended Kalman Filter (EKF) and Coulomb Counting methods.
- Developed SOC estimation algorithms in Embedded C specifically for the NXP microcontroller
- Debugged the final firmware on the hardware using a Lauterbach debugger, verifying the real-time performance of the SOC driver.

Fully Automated Production Line

The production Line Consists of 5 stages, Feeding, Assembly, Sorting, Disassembly, and Handling, the project was done mainly by using Arduinos, PCBs, Pneumatic Control systems, and Mechanical joints.

- Integrating and controlling pneumatic actuators, servo motors and stepper motors for assembly station.

Automated 3D Scanning Machine

- Built a stereo vision-based 3D scanning system using two webcams.
- Implemented computer vision pipeline for camera calibration, feature matching (SIFT), and 3D point cloud generation using python scripts.

Embedded MCU Driver Development

- Implemented full GPIO driver and an EXTI (External Interrupt) driver for the STM32F103C6 microcontroller.
- Developed embedded solutions incorporating LCDs and keypads with STM32F103C6 and ATmega32 microcontrollers with debugging using the Keil simulator and validated system functionality through Proteus simulation.

Heat Control On/Off Oven | RTOS Embedded System

- Developed an On-Off temperature controller using a potentiometer as a sensor and an LED as a heater and displayed the current temperature and setpoint in real-time on an LCD.
- Utilized UART for serial communication to send data to the LCD using putty

Machine Learning Object Detection

- Developed a real-time vehicle detection and classification system using Python, OpenCV, and a custom-trained YOLO model on videos and images.

Autonomous Robot

- Designed robot in Inventor, developed control software with ROS/Python in a V-rep simulation, and implemented a vision system using a Raspberry Pi, and PID control on DC motors.

Production Line PLC control

- Designed a production on FACTORY I/O and with the aid of Siemens TIA portal, programmed the production line process via Ladder and designed HMI module to visualize various states of simulated production line

Courses

Embedded Systems Diploma

- C programming, Data structures, algorithms, memory and computer architecture
- GPIO, Interrupts, LCD, Keypad and communication protocols (SPI, UART, I2C)
- FreeRTOS Kernel concepts, Context Switching, and Memory Management.

ROS and Robotics

- ROS architecture, including nodes, topics, and services for robotic applications.
- ROSSERIAL URDF MOVIT, Gazebo, RVIZ

Languages

Arabic **English (C1)**