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**](https://www.youtube.com/watch?v=GqiDOUGQDf8&ab_channel=youssefkhaled)

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)**