

# Mohamed Hany Hemdan

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## Professional Summary:

Motivated and detail-oriented **Embedded Systems Engineer** with expertise in C, C++, Python, and **AUTOSAR**. Experienced in developing embedded software and designing hardware interfaces for ARM and AVR microcontrollers. Currently finalizing a Graduation Project with **Siemens EDA** focused on Digital Twin simulation of in-vehicle network architectures using **Vector SIL Kit**, featuring an AUTOSAR-based implementation of an Autonomous Emergency Braking (AEB) system.

## Education:

**Beni Suef University** | Faculty of Electrical Engineering

- **Major:** Communication and Electronics
- **GPA:** 3.38
- **Expected Graduation:** June 2026

## Experience:

**Intern | ElAraby Group (Embedded Systems & Manufacturing)** | July – Aug 2025

- Analyzed the **Software Development Life Cycle (SDLC)** to optimize design and implementation phases for consumer electronics.
- Gained hands-on experience with diverse manufacturing cycles and industrial machine automation.

**Intern | NTI (Microcontroller-based Systems)** | June – July 2025

- Mastered advanced **Embedded C** techniques and memory optimization "tricks" for resource-constrained environments.
- Developed and implemented low-level **AVR peripheral drivers** (GPIO, UART, SPI) from scratch to enhance hardware abstraction.

## Projects:

**Graduation Project | Siemens EDA (Digital Twin & IVN Architecture)**

- Designed an **Autonomous Emergency Braking (AEB)** system, implementing the end-to-end braking decision algorithm.
- Developed **AUTOSAR-compliant Software Components (SWCs)** for sensor fusion, AEB logic, and actuator control within the Application Layer.
- Utilized **Vector SIL Kit** (System-in-the-Loop) to simulate distributed ECUs and validate in-vehicle network timing and performance.

**AI-Controlled Traffic System & Robotic Car**

- Engineered a robotic car using **Arduino** and **ESP32**, integrating **STM32F401** to process real-time traffic sign data and garage security.

**Electrical Pulse Medical Device**

- Developed a physiotherapy device generating controlled electrical pulses for muscle stimulation.

**Water Level Control System**

- Designed and implemented a system to monitor and control water levels in a tank with sound system to tell the status.

**Smart room automation**

- Built system to control every thing in the room using mobile app.

## Technical Skills:

**Industry Knowledge:** Embedded Systems Development, AUTOSAR Architecture, ASIC Design, Digital Logic, Algorithm Optimization.

**Microcontrollers:** ARM (Cortex-M), AVR (ATmega), PIC, ESP32, Arduino.

**Programming:** Embedded C, C++, Python, Rust, Java.

**Tools:** Vector SIL Kit, STM32Cube, Keil uVision, MATLAB/Simulink, Proteus, Yocto Project, Linux, Git.

## **Certifications & Courses:**

### **AUTOSAR Diploma | Learn-In-Depth (Eng. Keroles Shenouda) | *January – April 2026***

- Specialized in **AUTOSAR Architecture**, including ASW Layer concepts, Software Component (SWC) types, and Port/Interface configurations.
- Gained technical proficiency in **Understanding ARXML**, Runnables, RTE Layer, RTE Events, and Data Conversion.
- Mastered **OSEK-VDX** and **AUTOSAR OS** fundamentals: Tasks, Resources, Counters, Alarms, Events, ISR, and Hooks.

### **Embedded Linux Diploma | Eng. Moatasm Elsayed | *July 2025 – Present***

- Mastering **Linux Administration**, **Yocto Project**, and building custom distributions for embedded targets.
- Advanced programming in **C++**, **Rust**, and **Python** for AI-driven scripts and system-level applications.
- Implementing efficient software architectures using modern **Design Patterns**.

### **Mastering Data Structures & Algorithms | Udemy | *April – June 2025***

- Implemented popular **Data Structures** and **Recursive Algorithms** using C and C++.
- Conducted rigorous **Time Complexity Analysis** and optimized sorting algorithms for efficiency.
- Developed analytical skills to select and apply optimal data structures for complex engineering problems.

### **IoT Workshop | SECTOR B5 | *March 2025***

- Developed end-to-end **IoT projects** from scratch, integrating firmware with hardware components.
- Implemented **MQTT protocol** and networking concepts for smart device communication.
- Gained hands-on experience with **Raspberry Pi** and real-life IoT application fundamentals.

### **ARM Fundamentals | Creative Hub Beni Suf | *September – October 2024***

- Studied core **ARM Architecture** concepts and implemented low-level peripheral drivers.
- Integrated and interfaced hardware components, including **TFT displays**, with ARM microcontrollers.

### **Full Embedded Systems Diploma | Eng. Ahmed Abd El-Gafar | *June 2023 – February 2024***

- Comprehensive training in **Embedded C**, **Driver Design**, and hardware interfacing for **PIC** and **ARM** microcontrollers.
- Applied **RTOS** concepts, **Linker Scripts**, and **Bootloader** fundamentals for system initialization.
- Configured automotive communication protocols, including **CAN** and **LIN**, and introduced to **AUTOSAR** standards.