SALAH-ELDIN HASSEN

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EDUCATION

Cairo University Faculty of Engineering Department of Electronics and Electrical Communication Engineering (CUFE EECE), 3rd Year.   **October 2021 - 2026**

WORK EXPERIENCE

- **Coding & Mathematic AI Trainer // Outlier // Freelancing.**   **Nov 2024 - Present**
  teaching and optimizing AI models for coding and mathematical tasks. The role involves training, evaluating outputs, refining models, and creating scenarios to improve AI's proficiency in both fields.
- **Robotics Instructor // Beta Engineering Training Academy // Seasonal.**   **Jan 2023 - Present**
  Teaching Arduino started as technical support in the session's tasks, then became the main instructor and taught over 600+ students with great feedback.
- **Data Entry Clerk // Covo Connect // Full time.**   **Jun 2023 - Jul 2023**
  Entering banking data from photos to text. which improved my touch-typing skills.

SKILLS

Software:
- C / C++ - Assembly - Data Structures - Algorithms - OOP.
- Linux: Ubuntu - Kali Nethunter.
- Python - Automation - scripting - Terminal.
- HTML5 - CSS3 - JavaScript - Bootstrap - jQuery - Laravel.
- MATLAB, Qt, Git & Git-Hub.
- AI tools.

Embedded:
- Atmega16/32 Microcontrollers (AVR).
- PIC18F2XK20/4XK20 Microcontrollers (PIC).
- Fundamentals of Embedded systems.
- C for Embedded Applications (Embedded C).
- FreeRTOS - SOMEIP.

Tools:
- Visual Studio - Eclipse - MPLAB Code Configurator- MATLAB - Proteus - Intel 8086-emulator - Modelsim - Cadence - Multisim - Arduino IDE - QT Creator - DataGrip - Altium.

PROJECTS

Digital Multimeter on PCB.

- Description: developed a digital multimeter circuit capable of measuring voltage, current, and resistance. Voltage measurement range of -200V to 200V, current measurement range of 0.5 mA to 2A, and resistance measurement range of 0 to 5 Mega Ohm. Designed from scratch and performed on PCB.
- Key Elements: **ATMega32, PCB,** GPIO, LCD, Keypad, ADC, Relays, MUX, DEMUX.

FreeRTOS-Based Dual Microcontroller-Based Door Locker Security System

- Description: developed a door security system using two microcontrollers with FreeRTOS for task management. Designed to enhance access control through password authentication, I2C-based EEPROM storage, and automated door mechanisms.
- Key Elements: ATMega32, **I2C**, **USART**, **EEPROM**, **FreeRTOS**, **Semaphores**, **Queue**, PIR sensor, H-bridge.

I2C-Integrated Control Unit

- Description: monitor temperature, control a motor. It integrates multiple I2C devices, including a temperature sensor, RTC, external EEPROM, and a slave MCU.
- Key Elements: **PIC18F46K20, MCC** (MPLAB Code Configurator), I2C, USART, RTC, EEPROM, Motor Control.

Maze-Solving Line-Follower Robot Car

- Description: developed a maze-solving robot car that autonomously moves from the starting point to the end point. Features a Bluetooth module for remote control via a mobile application.
- Key Elements: **Arduino,** DC Motors, H-Bridge, Bluetooth Module, IR Sensors.

SFML Chess Game in C++

- Description: a chess game built with C++ and SFML, featuring a functional 8x8 board, piece movement, valid move highlighting, and an undo option. It showcases object-oriented programming and graphical rendering with SFML.
- Key Elements: **C++, SFML.**

Advanced Tic Tac Toe Game

- Description: developed a C++ Tic Tac Toe game with user authentication, personalized history, and AI using the minimax algorithm. Features an interactive GUI, secure user management, and performance optimization. Tested using Qt Test.
- Key Elements: C++, Minimax Algorithm, Secure Hashing, **Qt**, **Qt Test, SQLite, Git, GitHub Actions.**

Advanced Image Editor with Qt and OpenCV

- Description: built a C++ image editor with Qt and OpenCV, featuring cropping, resizing, filters (blur, grayscale, sharpen), and dark mode UI. Supported drag-and-drop image loading and real-time editing.
- Key Elements: C++, **OpenCV**, Qt.

COURSES

Advanced Embedded Diploma // Eng: Ahmed Abdel-Gafar   **Oct 2024 - Current**
- Developed automotive applications with CAN/LIN protocols and ARM Cortex-M microcontrollers.
- Applied AUTOSAR architecture and MISRA C standards for safety-critical systems.
- Built FreeRTOS applications for real-time task management and inter-task communication.

SOME/IP Workshop // BULLET - Eng/Hazem   **OCT 2024 - OCT 2024**
- Gained hands-on experience in SOME/IP protocol through a practical workshop. Implemented sample client-server communication as a basis for networked embedded systems, understanding service-oriented middleware for automotive and IoT applications.

Linux Fundamentals // IEEE ASU   **Aug 2024 - Sep 2024**
- Linux Basics: Learned file management, shell scripting, and user permissions.
- System Operations: Gained skills in process control, package handling, and filesystem management.
- Networking & SSH: Developed expertise in Linux networking, SSH, and web server setup.

Embedded PIC Diploma // Eng: Ahmed Abdel-Gafar   **Jul 2024 - Sep 2024**
- Basic Concepts of Embedded Systems - C Programming - Embedded Tools.
- PIC Micro-controllers Interfacing (Implement all the drivers) - C For Embedded Applications (Embedded C).
- Communication protocols (USART - SPI - I2C).

Embedded AVR Diploma // Eng: Mohammed Tarek   **Jun 2024 - Oct 2024**
- Basic Concepts of Embedded Systems - C Programming - Embedded Tools - Real Time OS(RTOS).
- Data Structures (Linked-List, Stack and Queue) - Software Engineering - HW Labs.
- AVR Micro-controllers Interfacing (Implement all the drivers) - C For Embedded Applications (Embedded C).

EXTRACURRICULAR ACTIVICITES

Aug 2022 – Jun 2023:   Chemistry Teaching Assistant with Dr. Ahmed Seif.
Nasa Hackathon (2023):   2-days Hackathon, we created a website for scientific research community.
ECPC Contestant (2022) & (2023)