

# SALAH-ELDIN HASSEN

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## EDUCATION

Cairo University Faculty of Engineering (CUFE)

2021 - 2026

- Bachelor of Electronics and Electrical Communications Engineering (EECE).
- Maintained a GPA of 3.3 (Very Good).
- Related Courses: Logic Design, Microprocessors, Analog IC Design I&II, Embedded Systems, Data Structure.

## WORK EXPERIENCE

Autonomous Embedded Member | Cairo University Eco Racing Team | Part-time

Apr 2025 - Current

- Mainly debugging and handling the communication between the ECUs via CAN protocol.

Robotics & Embedded Instructor | Beta Academy | Seasonal

Jan 2023 - Jan 2025

- Taught Arduino and AVR embedded systems to over 600 students with consistently excellent feedback.

Coding AI Trainer | Outlier | Freelancing

Sep 2024 - Dec 2024

- Trained and optimized AI models for coding in C++ and Python tasks to enhance code generation accuracy.

## SKILLS

**Software:** C/C++ - Python - MATLAB - OOP - Automation - Scripting - AI tools - Qt - Git & GitHub - LaTeX.

**Embedded:** STM32 - ARM Cortex-M - AVR - PIC - FreeRTOS - I2C - USART - SPI - CAN - SOMEIP.

**Digital:** HDL languages (VHDL, Verilog, System Verilog) - TCL - FPGA Xilinx - Linting.

**Web:** HTML5 - CSS3 - JavaScript - Bootstrap - jQuery - Laravel - SQL - JSON.

**OS:** Linux (Fedora(main), Kali Nethunter, Ubuntu) - Windows.

## PROJECTS

FreeRTOS-Based Dual Microcontroller Door Security System

Summer 2024

- Implemented password authentication, EEPROM storage via I2C, and automated door control mechanisms.
- ATmega32 - I2C - USART - EEPROM - FreeRTOS.

Advanced Digital Multimeter on PCB

Spring 2024

- Measuring voltage (-200V to 200V), current (0.5mA to 2A), and resistance (0ohm to 5Mohm).
- Designed the circuit from scratch and implemented it on a custom PCB.
- ATmega32 - PCB - GPIO - LCD - Keypad - ADC - Relays - MUX - DEMUX.

I2C-Integrated Control Unit

Summer 2024

- Developed a control unit for temperature monitoring and motor control using I2C devices with MCC firmware.
- PIC18F46K20 - MCC - I2C - USART - RTC - EEPROM.

Simulation & Linting Scripts

Winter 2024

- Developed Python and bash scripts for creating do files, running ModelSim, waveform viewing (GTKWave).
- Created Python script that creates TCL files for linting designs using Qverify.
- Python - bash - TCL - GTKWave - Qverify.

Multi-CV Generator Script

Spring 2025

- Developed a Python script to generate ATS-friendly LaTeX CVs from JSON data (used to generate this CV).
- Python - LaTeX - JSON.

Concurrent Rust TCP Server

Winter 2024

- Developed a multithreaded Rust TCP server, resolving port conflicts and optimizing client handling.
- Rust - Multithreading.

Advanced Tic Tac Toe Game

Spring 2024

- Created the game with AI (minimax), user authentication, game history, and a Qt-based GUI.
- Automated testing via Qt Test and GitHub Actions.
- C++ - Minimax Algorithm - Secure Hashing - Qt - Qt Test - SQLite - Git - GitHub Actions.

## Advanced Image Editor with Qt and OpenCV

Summer 2023

- Featuring cropping, resizing, filters, and a dark mode UI with real-time editing.
- C++ - OpenCV - Qt.

## SPI Slave Interface

Spring 2025

- Designed a modular SPI Slave Interface with RAM modules and validated using self-checking testbenches.
- Vivado - Questasim - Verilog - SPI - Single-Port RAM - Constraints - Linting.

## Spartan-6 DSP48A1

Spring 2025

- Designed and tested a DSP48A1 block in Verilog with C++ golden model and Verilog test benches.
- Verilog - DSP48A1 - C++ Simulation - Test Benches - Linting.

## Laravel Workshops System

Fall 2024

- Built a system for managing workshops with scheduling, registration, attendance, and a responsive UI.
- Laravel - PHP - MySQL - Bootstrap - Git.

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## OTHER PROJECTS

- MATLAB Signal Processing and Simulink Control System Projects.
- Analog IC Design Projects on Cadence.
- Maze-Solving Line-Follower Robot Car - Arduino-based pathfinding robot.
- SFML Chess Game - C++ chess game with an interactive GUI.

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## COURSES

### Advanced Embedded Diploma | Eng: Ahmed Abdel-Gafar

Dec 2024 - Current

- ARM Cortex-M4 architecture, debugging, memory systems, and the compilation process.
- Linker script, startup code, and device driver development for GPIO, RCC, SysTick Timer, and NVIC.
- Flash Memory Interface, bootloader design, implementation, and testing.
- LIN and CAN communication protocols, AUTOSAR architecture, and MISRA C compliance.

### Embedded PIC Diploma | Eng: Ahmed Abdel-Gafar

Jul 2024 - Sep 2024

- Embedded systems fundamentals, C programming, and PIC microcontroller driver development.
- Implemented USART, SPI, and I2C communication protocols using Embedded C.

### Embedded AVR Diploma | Eng: Mohammed Tarek

Jun 2024 - Oct 2024

- Embedded systems fundamentals, C programming, RTOS, and data structures (linked lists, stacks, queues).
- AVR microcontroller interfacing with driver implementation using Embedded C and hands-on hardware labs.

### SOME/IP Workshop | BULLET - Eng/Hazem

Oct 2024

- Practical SOME/IP protocol workshop with client-server communication for automotive/IoT.

### Linux Fundamentals | IEEE ASU

Aug 2024 - Sep 2024

- Learned Linux file management, shell scripting, and user permissions.
- Gained skills in process control, package handling, and SSH.

### Digital Design Diploma | Eng: Kareem Waseem

Jan 2025 - Mar 2025

- Studied digital and RTL design using Verilog for synthesis and simulation, FPGA design flow, and static timing analysis (STA).
- Worked with Vivado, IP catalog, clock domain crossing, low-power design, and Questa Lint for verification.

### Digital Verification Course | IEEE CUSB

Mar 2025 - Current

- Studied formal verification, UVM, sequences, configuration, and SystemVerilog assertions.
- Used QuestaSim for simulation, verification planning, and functional coverage.

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## EXTRA INFO

- First place in Robotics Competition (2022), ECPC Contestant (2022, 2023), NASA Hackathon participant.
  - Started coding and using Linux in high school (7 years ago); coding has since become a natural skill.
  - A dynamic and adaptable software engineer with a passion for solving problems and learning.
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