Salah Eldin Hassen

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EDUCATION

Bachelor of Electronics and Communications Engineering | Cumulative Grade: Very Good — *2021 - 2026*
Cairo University Faculty of Engineering (CUFE) — *Cairo, Egypt*

SKILLS

Software : C/C++ - Python - Vibe Coding - OOP - Automation - Scripting - AI Tools - Qt - Git & GitHub - LaTeX.

Embedded : ESP32 - STM32 - AVR - PIC - FreeRTOS - I2C - USART - SPI - CAN.

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

Web : HTML5 - CSS3 - JavaScript - Bootstrap - Servers - APIs - SQL - JSON.

Operating Systems : Linux (Fedora (main) - Ubuntu) - Windows.

INTERNSHIPS & WORK EXPERIENCE

Embedded & IoT Intern | Internship — *Jul 2025 - Current*
Lotus Power — *Hybrid | Maadi, Egypt*
- Developed IoT-based farm management devices, collaborating on embedded systems.

Fourth-Year EECE Department Representative | Volunteering — *Jul 2025 - Current*
Cairo University Faculty of Engineering (CUFE) — *Giza, Egypt*
- Collaborated with teaching staff and coordinated timetables to support department operations.

Autonomous Embedded Member | Volunteering — *Apr 2025 - Jul 2025*
Cairo University Eco Racing Team — *Giza, Egypt*
- Created IoT application for autonomous car, worked with CAN protocol, GPS module, and motor driver.

Robotics & Embedded Instructor | Seasonal — *Jan 2023 - Jan 2025*
Beta Academy — *Dokki, Egypt*
- Taught programming and Arduino to over 600 students with excellent feedback.

Coding AI Trainer | Freelancing — *Sep 2024 - Dec 2024*
Outlier — *Remote*
- Trained and optimized AI models for C++ and Python coding tasks.

PROJECTS

FreeRTOS-Based Dual Microcontroller Door Security System | Link — *Summer 2024*
- Implemented password authentication, EEPROM storage via I2C, and automated door control.
- Technologies: ATMega32 - I2C - USART - EEPROM - FreeRTOS.

Advanced Digital Multimeter on PCB | Link — *Spring 2024*
- Designed a multimeter for voltage (-200V to 200V), current (0.5mA to 2A), and resistance (0 to 5M ohm).
- Implemented the circuit on a custom PCB from scratch.
- Technologies: ATMega32 - PCB - GPIO - LCD - Keypad - ADC - Relays - MUX - DEMUX.

I2C-Integrated Control Unit | Link — *Summer 2024*
- Developed a control unit for temperature monitoring and motor control using I2C devices.
- Technologies: PIC18F46K20 - MCC - I2C - USART - RTC - EEPROM.

Simulation & Linting Scripts | Link — *Winter 2024*
- Developed Python and Shell scripts for creating do files and running ModelSim.
- Created Python script for TCL files to lint designs using Qverify.
- Technologies: Python - Shell - TCL - GTKWave - Qverify.

Advanced Tic Tac Toe Game | Link — *Spring 2024*
- Developed a Tic Tac Toe game with AI using minimax and Qt-based GUI.
- Implemented user authentication and automated testing with Qt Test.
- Technologies: C++ - Minimax Algorithm - Secure Hashing - Qt - Qt Test - SQLite - Git - GitHub Actions.

Multi-CV Generator Script | Link *Spring 2025*

- Developed a Python script to generate ATS-friendly LaTeX CVs from JSON data.
- Technologies: Python - LaTeX - JSON.

SPI Slave Interface | Link *Spring 2025*

- Designed a modular SPI Slave Interface with RAM modules.
- Validated using self-checking testbenches in Vivado and QuestaSim.
- Technologies: Vivado - QuestaSim - Verilog - SPI - Single-Port RAM - Constraints - Linting.

Spartan-6 DSP48A1 | Link *Spring 2025*

- Designed and tested a DSP48A1 block in Verilog with C++ golden model.
- Technologies: Verilog - DSP48A1 - C++ - Test Benches - Linting.

Reverse Tic Tac Toe Game | Source - Game *Spring 2024*

- Developed a 3x3 and 4x4 Reverse Tic Tac Toe game with web interface.
- Technologies: HTML5 - CSS3 - JavaScript.

COURSES

Embedded Linux Diploma | Edges Academy *Jun 2025 - Current*

- Mastered Linux administration, including system configuration and Bash scripting for automation.
- Developed Linux device drivers and device trees, tested on QEMU and Raspberry Pi.
- Learned Yocto Project for building custom embedded Linux systems with layers and recipes.
- Gained expertise in C++ OOP principles and Qt framework for GUI application development.

Advanced Embedded Diploma | Eng: Ahmed Abdel-Gafar *Dec 2024 - Current*

- Studied ARM Cortex-M4 architecture, debugging, memory systems, and compilation process.
- Developed linker scripts, startup code, and drivers for GPIO, RCC, SysTick Timer, and NVIC.
- Designed and tested bootloader with Flash Memory Interface.
- Learned LIN, CAN protocols, AUTOSAR architecture, and MISRA C compliance.

Embedded PIC Diploma | Eng: Ahmed Abdel-Gafar *Jul 2024 - Sep 2024*

- Learned 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*

- Studied embedded systems fundamentals, C programming, RTOS, and data structures.
- Implemented AVR microcontroller interfacing and drivers with hands-on hardware labs.

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 RTL design, FPGA flow, Verilog, synthesis, and timing analysis.
- Explored Vivado, IP catalog, clock domain crossing, and Questa Lint for verification.

EXTRACURRICULAR ACTIVITY

- First place in Robotics Competition (2022).
- ECPC Contestant (2022, 2023).
- NASA Hackathon participant.