

AHMED EHAB ATIF

R&D Product Engineer

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PROFESSIONAL SUMMARY

R&D Product Engineer with experience in developing autonomous robotic systems using ROS1 (Noetic) and ROS2 (Humble / Jazzy), C/C++, and Python. Work includes firmware development on STM32, implementation of motion control algorithms (PD/PID), and integration of embedded systems with navigation and perception modules. Background includes AI model deployment for computer vision tasks and application of machine learning techniques in robotics workflows. Focus areas include real-time control, robotic navigation, sensor integration, and system-level automation.

EXPERIENCE

R&D Product Engineer

FEDIS (Fixed Egypt for Digital Solutions and Information Security)

[June 2025 – Present](#) [Cairo, Egypt](#)

- Drive end-to-end product development, integrating embedded systems, hardware, and software interfaces to deliver innovative digital solutions with enhanced performance.
- Develop and test prototypes, creating schematics and BOMs while implementing rigorous validation protocols to ensure product reliability and manufacturability.
- Optimize product functionality through iterative testing and debugging, improving system efficiency and reducing development cycles.

Part-time technical instructor

Sector B5 -ITIDA-

[July 2023 – Present](#) [Smart Village, Egypt](#)

- Conduct 80+ instructional sessions on different fields like (Advanced Robotics, Modern C++, ...etc) to participants with diverse background.
- Lead 40+ practical projects, guiding participants to apply theoretical knowledge in robotics and embedded systems.

R&D Process Engineer

Bedo Innovating Education

[Dec 2023 – Jan 2024](#) [6th of October, Egypt](#)

- Led research and development efforts to optimize engineering processes, focusing on innovative educational technologies and solutions.
- Collaborated with cross-functional teams to design, prototype, and test new educational tools and systems.
- Analyzed and improved workflows for educational product development, streamlining processes to increase workflow by 25%.

Digital Fabrication Specialist

Sector B5 -ITIDA-

[Jul 2022 – Sep 2022](#) [Smart Village, Egypt](#)

- Provided technical mentoring on different engineering projects and provide instructional sessions on digital fabrication.
- Maintained and Operated different digital fabrication machines (like 3d Printers, Laser cutting machine, PCB milling machines).

EDUCATION

Bachelor's Degree in Mechatronics Engineering

Helwan University

[Sep 2018 – June 2023](#)

- Cumulative grade:** Very good with honors
- Graduation project:** Excellent

STRENGTHS

CModern C++Python

Rust (Intermediate)Linux

Data Structures & Algorithms

ConcurrencySQLOOP

Design PatternsGitHub

SOLID PrinciplesGit

Agile & Scrum

NumPyPandasXGBoost

Scikit-learnMatplotlib

Reinforcement Learning

Recommenders Systems

Deep LearningPyTorch

TensorFlowCNN

AVRARMRaspberry Pi

STM32Embedded CSPI

BootloadersEmbedded IoT

State MachineMISRA C

CAN/CAN-FD/LINUART

I2CRTOS

Motion ControlROS1

ROS2Robot Navigation

PROJECTS

Autonomous Mobile Warehouse Robot

Graduation project

- Developed an autonomous mobile warehouse robot using ROS for real-time navigation and STM32 for low-level motion control.
- Implemented PD control, sensor integration, and obstacle avoidance to enable autonomous operation in structured environments.

Robotics Projects

SOS v3 Firefighting Robot

- Designed and implemented control algorithms for a fire-fighting robot competing in SOS v3.
- Led the control team for a fire Fighting Robot, optimizing sensor-actuator integration and navigation.

Maze Solving Robot

- Built a line-following and maze-solving robot with microcontroller-based logic and state machine control.
- Designed and programmed a maze-solving robot, securing 2nd place in a robotics competition.

ROV Control System

- Contributed to the design and development of the control system for a Remotely Operated Vehicle (ROV).
- Implemented joystick-based manual control and real-time motor interfacing for directional underwater navigation.

AI Projects

Neural Network from Scratch (MNIST)

- Developed a two-layer neural network using NumPy to classify handwritten digits from the MNIST dataset.
- Implemented manual forward and backward propagation, achieving 95% accuracy without external ML libraries.

Image Classification with CNNs

- Designed and trained CNN models using TensorFlow to classify images from MNIST, CIFAR-10, CIFAR-100, and Cats vs. Dogs datasets.
- Achieved 98.96% accuracy on MNIST and over 97% on other datasets using transfer learning and regularization techniques.

ML Techniques from Scratch & Scikit-learn Comparison

- Implemented linear and logistic regression models from scratch and validated performance on datasets including housing prices and MNIST.
- Compared custom models to Scikit-learn implementations to evaluate accuracy and convergence behavior.

Embedded Systems Projects

Smart Home System

- Designed a secure smart home architecture with 4 distributed ECUs and a central CPU for coordination and data exchange.
- Implemented communication protocols and system logic in C to manage sensor data and device control securely.

PID

PLC Programming

Robotics Control

RPA

Digital Fabrication

Proteus

PCB Design

Laser Cutting

Circuit Analysis

3D Printing

CNC Milling

Eagle

MATLAB

LABVIEW

Qt Creator

Qt

Debugging & Testing

COURSES & TRAININGS



Embedded Software Development (ARM)

IMT | 100 hours



Embedded Software Development (AVR)

IMT | 120 hours



Embedded Systems Course

Ahmed Abdelghafar | 240 hours



Classic Control & PLC Programming (Basic Track)

HA Consulting Group | 120 hours



PLC Programming (Advanced Track)

HA Consulting Group | 100 hours



Machine Learning A-Z

Udemy | 43 hours



Mathematics for Machine Learning Specialization

Luis Serrano | 93 hours



Machine Learning Specialization

Andrew Ng | 94 hours



Deep Learning Specialization

Andrew Ng | 125 hours (in progress)



Technical Training - Sector B5

Digital Fabrication, CAD, PCB Design, and Robotics | 5 months

Scientific Calculator using ATMEGA32

- Built a scientific calculator using ATMEGA32 with LCD output and keypad interface.
- Programmed real-time computation logic in C using interrupt-driven architecture for responsive operation.

Ventilator Design

- Contributed to a basic ventilator system with control logic for airflow, pressure, and breathing cycles.
- Handled real-time data from sensors and actuated motors using embedded C on a microcontroller platform.

Clinic and Bank Terminal Systems

- Developed standalone terminal-based systems in C for clinic and bank operations including user interaction, record handling, and flow control.
- Structured code using modular design to simulate multi-user environments with input validation and data processing.

Qt C++ Projects

Media Player

- Developed a media player application using Qt C++ with support for audio and video playback.
- Integrated multimedia features using QMediaPlayer and implemented custom UI using Qt Widgets.

Windows Calculator Clone

- Created a functional clone of the Windows calculator using Qt C++.
- Implemented button-grid interface, input parsing, and real-time expression evaluation.

To-Do List Application

- Built a task management app with add, delete, and complete functionalities using Qt Widgets and layouts.
- Used Qt's Model-View architecture to manage tasks efficiently and ensure UI responsiveness.

Data Entry Application

- Developed a desktop data entry system using Qt C++ for structured input and record storage.
- Focused on modular design and UI validation for safe and consistent user data handling.

VOLUNTEERING EXPERIENCE



Executive Chairperson – IEEE Helwan Student Branch (Aug 2022 – Aug 2023)

Led a team of 6 officers and 15 directors, organized 4 events including sessions for about 3000 student and 4 competitions for 38 teams (about 400 participant). Managed 320 students and contributed to the local engineering community, winning 3 global prizes.



RAS Chapter Director – IEEE Helwan Student Branch (Sep 2021 – Aug 2022)

Managed 15 project selections, coordinated events, and trained volunteers. Focused on event planning, leadership development, and team coordination.



RAS Project Team Control Leader – IEEE Helwan Stu- dent Branch (Sep 2020 – Sep 2021)



ROV Control Member – Robotics Student Organiza- tion (Sep 2020 – Aug 2021)



R&D Member – Robotics Student Organization (Oct 2019 – Sep 2020)