

EDUCATION

- **Alma Mater Studiorum - Università di Bologna** September 2025 - Present
 - *Master of Science (M.Sc.), Communications Engineering.*
- **University of Science and Technology at Zewail City** September 2020 - June 2025
 - *Bachelor of Science (B.Sc.), Communications and Information Engineering; CGPA: 3.2/4.0*
 - **Graduation Thesis** Design and Development of a UAV for Fire Detection and Suppression
 - **Supervisor** [Prof. Moustafa Elshafei](#)
- **The Red Sea STEM School, Hurghada** October 2017 - July 2020
 - *High School Degree; GPA: 3.7/4.0*

EXPERIENCE

- **Raya Electric for Manufacturing** June 2024 - June 2025
 - *Information Technology Administrator*
 - Provide technical support and manage systems remotely using SCCM, MDT, and WDS.
 - Update software with Kaspersky and WSUS, handle help desk operations, and implement Active Directory policies.
 - Ensure compliance with ISMS and ISO standards.
- **OBM Education Company** August 2019 - December 2022
 - *Software Engineer*
 - Began career at OBM Education from high school and officially joined as a part-time technical developer from August 2020 to December 2022.
 - Worked extensively on digital transformation projects, focusing on the website and application development.
- **Junior Teaching Assistant at Zewail City of Science and Technology** October 2022 - May 2023
 - *Courses: Fundamentals of Computer Programming and OOP, Database Management System*
 - Assisted in teaching and mentoring students in C++ programming, data structures, and SQL database concepts.
 - Conducted lab sessions, graded assignments, and provided technical guidance on course projects.
 - Supported students in debugging code and optimizing database queries to enhance their problem-solving skills.

PROJECTS

- **Design and Development of a UAV for Fire Detection and Suppression** November 2024 - June 2025
 - *Graduation project*
 - Developing an autonomous VTOL UAV for fire detection and suppression, integrating computer vision and flight control. Configuring the PX4 (Pixhawk) flight controller for stability and implementing MAVLink to interface it with a Raspberry Pi. Using MAVROS for autonomous navigation and suppression missions while incorporating thermal imaging and obstacle avoidance for effective fire detection in hazardous environments. [\[Reference Link\]](#)
- **Research on IoT and Wireless Communication Protocols** October 2024 - January 2025
 - *Academic Research*
 - Conducted an in-depth study on IoT communication techniques, specifically LoRa and NB-IoT, analyzing their technical specifications, applications, and performance trade-offs in LPWAN deployments. [\[Reference Link\]](#)
 - Explored the T-MAC protocol and IEEE 802.15.4 standard for low-power wireless sensor networks, evaluating their efficiency in minimizing energy consumption and handling network scalability. [\[Reference Link\]](#)
- **Wireless Sensor Network Simulation and Lifetime Optimization** October 2024 - January 2025
 - *Academic Project*
 - Designed and simulated a WSN model in MATLAB to optimize network lifetime. Analyzed energy consumption in transmission, reception, and data processing under various configurations. Implemented direct and dual-hop transmission, evaluating sink node placement. Developed clustering algorithms to enhance energy efficiency, achieving a 20% increase in network lifetime. Conducted simulations to assess transmission radius and cluster head rotation effects. [\[Reference Link\]](#)

• **AI-Powered Safety Monitoring System for Jotun Egypt**

Industrial AI Computer Vision Project

- Developed an AI-driven system to detect safety violations in real time at Jotun Egypt's factory using YOLO object detection. Designed and implemented the AI models for detecting helmets, coveralls, and restricted area violations. Built a Next.js dashboard integrated with Pocketbase to track violations, stream live footage, and provide data analytics for safety compliance. Enabled real-time notifications to the safety team via mobile alerts, ensuring immediate action on detected violations. [\[Reference Link\]](#)

• **Electric Vehicle Rally (EVER V)**

September 2023 - August 2024

Head of Embedded Systems Team

- Led the Embedded Systems team in developing real-time communication between vehicle sensors and the strategy dashboard. Designed a data acquisition system to improve race analytics and decision-making. Developed an interactive GUI for the driver, displaying critical vehicle status and energy consumption metrics to optimize performance during race conditions. [\[Reference Link\]](#)

• **Minesweeper Robot**

February 2022 - March 2022

International Competition Academia Category

- Worked in the Electrical and Software team, developing robot localization and minefield mapping. Implemented image processing using OpenCV on a Raspberry Pi for object detection and classification. Integrated sensor data for real-time autonomous navigation, ensuring precise mapping and mine detection to enhance robot efficiency in complex terrains. [\[Reference Link\]](#)

TECHNICAL SKILLS

- **Programming Languages** Python, C/C++, TypeScript, JavaScript, HTML/CSS
- **Web Development** ReactJS, Next.js, Node.js
- **Machine Learning and AI** YOLO Object Detection, Computer Vision, OpenCV, AI Model Development
- **Robotics and Automation** PX4 (Pixhawk), MAVLink, MAVROS, Raspberry Pi, ROS, Embedded Systems, LabVIEW
- **Networking and IoT** Wireshark, Cisco Packet Tracer, ESP8266, MQTT, LoRa, NB-IoT
- **Cloud and IT Infrastructure** AWS, Microsoft SQL Server, SCCM, MDT, WDS, WSUS, IT Service Management
- **Simulation and Modeling** MATLAB, Simulink, CST Studio Suite
- **Collaboration and Tools** GIT, Arduino, Jira, Slack, Microsoft Office, Troubleshooting and Testing, Fast Learner, Teamwork

EXTRA-CURRICULAR ACTIVITIES

- **Head of Embedded Systems Team at ZC Racing Team in EVER Rally Competition** January 2024 - August 2024
- **Court Judge at Zewail City Student Court** August 2023 - August 2024

REFERENCES

- **Dr. Samy Soliman** Associate Professor, and Director of Communications and Information Engineering Program
Email: ssoliman@zewailcity.edu.eg
- **Prof. Moustafa Elshafei** Professor, Communications and Information Engineering Program. Email: moelshafei@zewailcity.edu.eg
- **Dr. Ahmed S. Abd-Rabou** Visiting Assistant Professor, Nanotechnology and Nanoelectronics engineering Program
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