Mahmoud Shanan

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EDUCATION

2023-2024 **University of Manchester**
MSc Robotics

Robotic System Design Project (2 semesters)

- Leading a team of 4 students to develop and upgrade a mobile robot (Leo Rover), which can autonomously retrieve an object from an environment (more details in portfolio)
- Assembling the Leo Rover, and designing a 3-D printed loading cell, that will be placed on top of the rover, to fit a robotic manipulator, stereo and thermal cameras, a Lidar, and IMUs
- Developing the Leo Rover software, including designing controllers and implementing machine learning and computer vision algorithms, using ROS 2, Gazebo simulation, python, and C++

Platform Design, Mechatronics, and Control Dissertation (Summer)

- Researching and developing a suitable robotic application that meets a perceived need, under the research theme: Platform design, mechatronics, and control
- Analysing the need, and design an appropriate solution using robotics software, simulation, and CAD tools, running through technical competence, creativity, and problem-solving skills
- Writing a 15-page conference-style paper, describing the methodology used, analysis of the application in question, and the design and evaluation of the proposed solution, including its theoretical and practical significance

2020-2023 **University of Manchester**
BEng Mechatronic Engineering – First Class Honours

Drone Control for Wind Turbine Inspection (Final Year Individual Project) – Grade: 80%

- Performed hardware-in-loop simulation to evaluate the performance of PID control in UAVs, using MATLAB/Simulink and QUARC real-time control software; designed and tuned cascaded PID controllers to control pitch and yaw of the helicopter and bi-copter configurations of the Quanser Aero 2 platform
- Researched a new configuration for the studied platform, and modified the mathematical model of the system, such that it is controlled as a quadcopter (more details in portfolio)

Embedded Systems Project (Second Year) – Grade: 92%

- Led a team of 5 students to develop a microcontroller-based buggy, which can autonomously follow a line around a track using infrared sensors, and coordinated between the team and supervisor, thus building up my leadership and project management skills (more details in portfolio)
- Used SolidWorks to design the chassis, assisted in the design of the sensors' PCB on Altium, wrote the control algorithm of the buggy in C++, using object-oriented programming methods to read data from sensors and control the DC motors of the buggy, so forth performing 5 different manoeuvres (going forward, uphill, downhill, turning right and left, and stopping)

2006 – 2020 **Lycée International Balzac, Cairo Egypt**
French Baccalauréat Série S – Mention Très bien (17.6/20)

- Mathematics (19/20), Physics and Chemistry (17/20), Earth Sciences and Biology (15/20), History and Geography (14/20), Philosophy (14/20)

WORK EXPERIENCE

August 2023 **ElSewedy Electric – Special Cables Plant**
Engineering Summer Intern (3 weeks)

- Explored different types of cables (fibre optics, LAN, automotive, …) and their manufacturing processes, including the type of conductor used, insulation materials, core assembly, and armouring
- Discovered the production planning process, including analysing material and machine availability, allocating machines efficiently, estimating delivery times, and issuing daily reports
- Comprehended the working principles of machines in the plant, and the different mechanical and electrical tests performed to ensure the quality of the final product

August 2022 **Amir & Joseph Service Centre**
Technical Service Advisor Intern (5 weeks)

- Studied internal combustion engines, and different types of automotive gearboxes
- Understood electric energy generation and distribution, alongside multiplexing principles, allowing instant communication between the different control units in a petrol engine car
- Applied diagnosis and fault-finding methods, while analysing different sensors and actuators inside IC engines and gearboxes, using wiring diagrams and software

August 2018 **Hamleys**
Sales intern (1 month)

- Entertained almost 30 walk-in customers per day to make them feel the Hamleys ambiance
- Guided customers through their shopping experience in 4 different isles of the store, and learned how to adapt in a fast-paced atmosphere
- Succeeded in drawing smiles on children and parents' faces by navigating them through Hamleys' world of fun and magic

POSITIONS OF RESPONSIBILITY

July 2022 **Dale Carnegie**
How to win Friends and Influence People (3-day course)

- Learned Dale Carnegie's methods of communicating professionally and confidently, and applied them during group activities simulating different business situations; built relationships based on trust and accountability, demonstrated leadership principles, explored strategies for expressing ideas and persuading people, and practiced public speaking

October 2021 – June 2022 **University of Manchester**
Peer Assisted Study Sessions (PASS) Leader

- Guided first year students through their studies and university experience in 1-hour sessions every week

October 2020 – June 2021 **University of Manchester**
Robotics Society

- Assembled and programmed a microcontroller-based buggy capable of avoiding obstacles and navigating autonomously, using Arduino and ultrasonic sensors

SKILLS

Software:

- Proficient in MS Office, Ubuntu (Linux), Mac OS, C programming, C++, Python, assembly, and VHDL
- Proficient in ROS 2, Gazebo Simulator, MATLAB/Simulink, SolidWorks, Altium, LabVIEW, and Multisim

Languages:

- Fluent in spoken and written English, French, and Arabic. Intermediate level in Spanish (B2)