Mahmoud Ismail

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Summary

Fresh engineering graduate with hands-on experience in robotics and autonomous systems. Achieved 3rd place globally in Shell Eco-marathon autonomous competition, integrating mechanical with software to deliver real-world solutions.

Education

Cairo University *Giza, Egypt*
Bachelor of Mechanical Design and Production Engineering *2020 – 2025*

Experience

Indomie Egypt *Badr City, Cairo*
Production Planning & Warehouse Intern *Jul 2025 – Aug 2025*
- Built **linear programming model** for **RM & FG flows**, saving ~30 min/day
- Automated warehouse Excel reports, saving ~2 hrs/day, improving **supply chain** visibility
- Used **Microsoft Dynamics ERP** for **dispatch, RM tracking**, and stock updates

Shell Eco Racing Team (CUERT) *Cairo University, Egypt*
Director of Autonomous Teams *Jan 2025 – Jul 2025*
- Directed 35+ engineers; built **ROS1 perception pipeline** and **CAN link** (Jetson–STM32).
- Integrated **MATLAB/SolidWorks models** with URDF for ROS; enabled energy-efficient **velocity profiling**.
- Deployed **CARLA-in-Docker** and automated workflows with **Python/Bash**, cutting integration time by 40%.
- Achieved **3rd place globally** in Shell Eco-marathon Autonomous Programming Competition 2025.

Leader of Autonomous Development Team *Jul 2024 – Jan 2025*
- Recruited/mentored 23 engineers; shifted to **Agile**, reducing onboarding by 80%.
- Launched 3 projects: **system optimization, velocity-energy profiling, embedded integration**.

Member of Autonomous Development Control Team *Sep 2022 – Jul 2024*
- Built ROS1 base for testing autonomous vehicle control algorithms.
- Applied **engine performance map** to automate driving parameter calculations for efficient cycles.
- Implemented **PID (longitudinal)** & **Stanley (lateral)** controllers, boosting efficiency by 300%.

SLB Company (Schlumberger) *6th of October, Egypt*
Production Systems Intern *Jul 2024 – Aug 2024*
Leading global provider of technology for reservoir characterization, drilling, production, and processing
- Worked with **cross-cultural teams** on casing strings & hydraulic liner hangers, for wellbore integrity.
- Gained hands-on knowledge of TRSCSSVs, bridge plugs, packers and subsea devices.
- Conducted electrical testing on **ESP motors & pumps**, **presented** results to managers.

Egyptian Atomic Energy Authority *Nasr City, Egypt*
Mechanical Engineering Intern *Apr 2023 – May 2023*
- Researched nuclear reactor designs and heat-transfer systems.
- Presented comparative analysis of reactor trade-offs to senior engineers.

Projects

Autonomous Tow Tractor - Graduation Project *Nov 2024 – Jul 2025*
https://github.com/GP-Autonomous-Tow-Tractor/tow_tractor_ws ↗
Designed an autonomous tow tractor using ROS2 & real hardware for **material handling**.
- Built **ROS2 system** integrating **Gazebo sim, Nav2, SLAM Toolbox** for navigation & mapping.
- Modeled tractor with **URDF/Xacro**, implementing rear-wheel steering & differential drive.
- Developed **sensor drivers** (IMU, LiDAR, encoders, camera) with Kalman filter for odometry.

Autonomous Vehicle Traffic-Aware Control System - Shell Eco Racing Team *May 2025*
https://www.youtube.com/watch?v=0uErVfB_nWY ↗
Traffic-aware path planning & control for autonomous vehicles.
- Designed **traffic logic** in ROS with real-time path planning & collision avoidance.
- Enhanced control with **longitudinal/lateral controllers** for dynamic responses.

Hardware Python Library - Graduation Project, Shell Eco Racing Team *Apr 2025*

Python library for modular sensor & actuator integration on embedded robotics platforms.
- Designed an **OOP Python library** with Serial, SPI & CAN drivers for **Raspberry Pi, Jetson Xavier**
- Implemented low-level **buffering, framing, error handling** and high-level sensor/actuator APIs.
- Provided extensible interfaces with **logging, connection mgmt, auto message handling**.

Bash Shell Interpreter - ALX   *Mar 2024*
UNIX command line interpreter project in C.
- Developed a practical **UNIX shell** supporting **interactive & non-interactive modes**.
- Integrated system calls to manage processes, environment variables, and program execution.
- Implemented built-in functions with argument parsing and PATH command execution, achieving 120% project score.

Autonomous Vehicle Control ROS Package - Shell Eco Racing Team   *Feb 2024*
Control system for Shell Eco-racing vehicle.
- Developed **PID + Stanley controllers** in ROS, boosting energy efficiency **3×**.
- Tested system in **CARLA Simulator** with Python/Linux integration.

Energy Performance Evaluation ROS Package - Shell Eco Racing Team   *Jan 2024*
ROS package for vehicle energy metrics.
- Built ROS package for **efficiency & distance analysis** using Python + CARLA.
- Enabled **real-time monitoring, data logging, Matlab analysis** for performance evaluation.

Designing Mechanical Press Machine - Mechanical Design Project   *Apr 2023*
- Designed **CAD assembly** in SolidWorks; performed **motion study & FEA safety checks**.
- Produced exploded views & working drawings for manufacturing.

Skills

Programming: Python, C/C++, Git, Bash Scripting, Supervised ML, Pandas, NumPy, URDF, XACRO, SQL

Software/Hardware Tools: ROS 1, ROS 2, Gazebo, CARLA, Nav2, Microsoft Planner, Microsoft Office, SolidWorks, MATLAB, Linux OS, Jetson Xavier, Raspberry Pi, Arduino, Serial, CAN

Concepts: Autonomous Navigation, Control Systems, Data Analysis, OOP, Data Structures, Sensor Fusion, SLAM, State Estimation

Soft Skills: Leadership, Team Collaboration, Adaptability, Problem-Solving, Presentation, Communication, Attention to Detail, Agile, Fast Learner

Languages: English, Arabic

Certifications

- State Estimation and Localization for Self-Driving Cars - University of Toronto, Coursera
- Introduction to Self-Driving Cars - University of Toronto, Coursera
- Supervised Machine Learning - Stanford Online, Coursera
- Data Analysis Professional Nanodegree - FWD, Udacity
- Software Engineering Program - ALX
- Git and GitHub - Google, Coursera
- Machine Design - Georgia Institute of Technology, Coursera

Extracurricular Activities

Ministry of Youth and Sports, Egypt   *Egypt*
COP27 Organizer   *Sep 2022 – Nov 2022*
- Volunteered as part of the youth team organizing the UN COP27 Climate Summit in Egypt.
- Supported event logistics and served as an on-ground organizer during the conference.

Technical Center for Career Development (TCCD)   *Cairo University, Egypt*
Graphic Designer   *Sep 2021 – Jul 2022*
- Created tens of posters and designs using Photoshop and Illustrator to elevate social media advertising efforts.
- Coordinated 5 technical events such as Math Day and Job Fair events.