Ahmed El Araby

Automation & Robotics Engineer

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SKILLS & LANGUAGES

- Python (Intermediate)
- Java (Intermediate)
- C++ (Intermediate)
- Embedded C (Intermediate)
- MATLAB (Intermediate)
- SimMechanics (Beginner)

- ROS (Intermediate)
- Arduino (Beginner)
- AutoCAD (Advanced)
- SolidWorks (Advanced)
- Simulink (Beginner)
- MS office (Intermediate)

- English (Professional)
- Arabic (Native)
- French (Basic)
- German (Basic)

EXPERIENCE

08/2021 - 09/2022 **Control Engineer Trainee**, **Visioneering Intralogistics**

- We learned about Industrial control engineering and Material handling equipment, techniques, and its applications in Logistics Automation Systems.

- Over the course of two weeks, we learned how a big name and company like Bastian Solutions in the automation industry in Europe & America uses it's expertise in PLCs and automation to develop a system using conveyors, sorters and HMIs to construct a fully automated system.
- We learned SCL programming of PLCs, Control standards, and HMI.

07/2021 - 08/2022 **Industry Intern**, **Schneider Electric**

- The internship was Hybrid (Online and on-site), we learned both **technical** and **commercial** skills. Online sessions were 5 days a week, purely commercial and logical, and on-site meetings were attended 3-4 times a week with end-users and then evaluating these meetings with our mentor.

- Moreover, technical sessions were attended where we learned the working principles of Electric drives and Scada automated systems.

08/2021 - 10/2021 **Reverse Engineer Intern**, **Arabo Filters**

- For the three months I spent at Arabo Filters, I used my mechanical design skills in AutoCAD & SolidWorks I was assigned to redesign (Reverse Engineer) the preexisting filter models.

- Examples of products I've redesigned are the Dust Collector, Pressure Vessels, Pre-Filter, Stainless Filters, Housings, Replacement Elements, and more.

- Besides the design process, I attended meetings with the company sales representatives meeting end-users to come to agreements with the products we offer.

EDUCATION

2019-2023   **Automation & Robotics Engineer** (BE)**,** German International University

Grade: Excellent (to be Honors) / GPA: 1.49 (German Credit Hours grading system)

Ranked 4th (3rd semester in the Robotics department)

10/2021   **High School,** Nermine Ismail Schools (Egypt 2000)

IGCSEs score: 94.8%

Certificates

07/2022   **Excel Essential Training** (Office 365/Microsoft 365)

09/2021   **SolidWorks professional**, CAD Masters

07/2020   **GIU Summer Technology Camp** (Robotics, Artificial Intelligence)

Projects

Brief summary for the projects I've worked on so far,

Autonomous car, using Arduino a car body, and a couple of ultrasonic motion sensors. it just drives itself until it bumps into something it just reverses for a second turns 90 degrees and so on.

Car parking sensor, a remote-controlled car that produces sound with different frequencies depending on the distance from an obstacle, plus an LDR that lights a lamp when it goes dark, coded on Arduino. I made this project solely.

Robotic Arm, a robotic arm that takes an object from point A to point B repeatedly, it can be calibrated to wherever the desired destination is. Using multiple ATMEGAs and programmed on Atmel Microchip. *This project did not work as intended as the physical body broke.*

Robotic Leg,

- Firstly, we redesigned the leg to fit the motors available in our market on SolidWorks
- Secondly, we used Arduinos to control the motors and the motion of the leg.
- Moreover, the data collected was imported to MATLAB and simulated on Simulink to compute the Inverse Kinematics for the leg motion.
- Finally, the project worked as intended, the simulation on SimMechanics was replicated by the hardware. https://imgur.com/a/kPskVuR (Working Project)

Raspberry Pi Weather Station,

- This is an IoT based project with the purpose of sending weather conditions data from a RPI 4 board and other sensors to *ThingSpeak* and by *Mail.*
- Coded on Raspberry Pi 4's built in Python IDE Thonny.
- The sensors used were the DHT22 (Temperature & Humidity) and FC-37 (Rain detection)

Universal Robot (UR5e) emulating the 4-color memory game,

- Using the Universal Robot provided by the university, the robot is to imitate a 4-color memory game using a python code written from scratch tailored for the UR and implemented on ROS.

- The code randomly generates 4 colors (at first then complexity increases in level), and the user should match the colors to win, in case the user wins, each color has an array of angles of the joints using Inverse Kinematics stored in each color and translates to a certain predetermined coordinate frame obtained from the teach pendant.

Parallel Robot,

- 3RPR robot's function is to draw a circle in the middle of the end-effector or pick up an object or any applications surrounding the use of the center of the end-effector.

- The design was constructed on SolidWorks, then imported to MATLAB and opened in Simulink (SimMechanics) to convert the revolute joints to active joints since this is how the mechanism receives its actuation, 3 revolute active, 3 prismatic passive and 3 revolute passives.

- Inverse Kinematics are also computed on SimMechanics before it's simulated.

- Hardware is implemented on Servos as the active revolute joints and connected to an Arduino/ to control its position received from MATLAB.

SLAM & Autonomous Navigation on Turtlebot 3,

- This project use Robot Operating System as a framework in the implementation of Simultaneous localization and mapping (SLAM) on a Turtlebot.
- Using gmapping algorithm for the mapping process and Rviz & Gazebo for the simulation.
- The robot also reaches a destination given a position on a 2D map using AMCL which is a probabilistic localization system for a robot moving in 2D. It implements the adaptive (or KLD-sampling) Monte Carlo localization approach (as described by Dieter Fox), which uses a particle filter to track the pose of a robot against a known map. Integrated using ROS navigation.

Detection of traffic signs using Image processing techniques & Neural Networks.

- This Project is still a work in progress, traffic signs were only detected using image processing algorithms.
- The current part is to detect traffic signs using Convolutional Neural Networks.

References

References are provided upon request.