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Hadi Elnemr

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A Mechatronics Engineering student, seeking an opportunity to work on Autonomous Vehicles and willing to continue my academic studies and research in this field.

Education

Bachelor Project and Thesis **March — September 2022**
Rheinisch-Westfälische Technische Hochschule (RWTH) Aachen.
Topic: Lane-level Map Matching Algorithm for Model-scale Vehicles (read here)
Grade: 1.0 (Equivalent to A, highest grade) (German scale GPA 1.0 - 5.0)

Bachelor of Science in Engineering Materials and Sciences (EMS), Mechatronics major **September 2018 — July 2023**
The German University in Cairo, Current GPA: 0.82 (A+ in German Standard GPA).

Specialization Courses: Autonomous Systems, Classical, Modern and Optimal Control Engineering, Embedded Systems, Advanced Mechatronics Engineering and Hybrid Automata, Optimisation Techniques, Reinforcement Learning, Image Processing, Bond Graphs Technique, Data Engineering, Finite Element Methods, Pneumatic and Hydraulic Control, Mechanics of Machinery, Engineering Mechanics, Programming, Data Structures and Algorithms, Strength of materials, Thermodynamics, Fluid Mechanics, Industrial Automation, Engineering Design, Digital Logic Design, Digital System Design, Power Electronics, Electric Machines.

Experience

GUCInnovators Research and Innovation member **August 2022—Ongoing**
- Extracted map data points representing a racing track.
- Developed an algorithm that converts data points to the required format.
- Used an optimisation algorithm to obtain a Racing Line.

Research Intern **August—September 2021**
Control and Dynamical Systems Lab — The German University in Cairo

- Developed a web server and a Socket programming channel besides a MAVLink UDP connection to communicate data between a raspberry pi and a PC.

GUCBrain projects member **January 2020-–December 2021**
- A machine learning AWG in the GUC. Did several machine learning tasks and attended tens of ML sessions.

IEEE GUC SB Senior Hardware Committee member **September 2018-–December 2021**
- Practiced Android Development, worked on Arduino, MATLAB, C and ROS tasks.

Junior Teaching Assistant **February 2020-–January 2021**
German University in Cairo — Cairo, Egypt

- Mentored students in the Introduction to Programming and OOP (CSEN 202) course Labs.
- Mentored students in the Data Structures and Algorithms (CSEN 301) course Labs.

Trainee **August, 2020**
Robo-Tech EG — Alexandria, Egypt

- Trained on Robot arm designing, analysing, manufacturing and control.

Intern **July 2019 — September 2019**
International Turnkey Systems (ITS) — Cairo, Egypt

- Worked on a web application project based on ASP.Net MVC framework.

Additional Experience

- **DEBI Robotics Competition.** Qualified to the round of 16 out of 200 participating teams.
- **ACM ICPC GUC Community member.** Took pupil's and Specialist's plans.
- **ECPC qualifications contest.** Participated in the GUC qualifications.
- **Catalyst's Coding Contest, Google HashCode and Code Jam Participant.**
- **Nasa Space Apps competition participant.**

Projects

- **Autonomous Car Localization, Planning, Control, and communication** Modified an on-shelf scaled RC car (Ackermann Drive) by hacking its actuators, adding different sensors, mounting processors and implementing simulations and communications using ROS.
- **Multi-UAV Task Assignment and Path Planning** Implemented multiple optimisation algorithms to solve the MUTAPP problem. Used algorithms include: Simulated Annealing, Genetic Algorithm, Ant Colony Optimisation, Whale Optimisation Algorithm, Dragon-fly Algorithm.
- **Robot Arm Implementation and Control** Fabricated and implemented a robot arm and applied trajectory planning and control.
- **Real-Time Embedded System for UGVs for Warehouse Management** Modeled a differential UGV and controlled it using Stateflow and Hybrid Automota.
- **UK 2009 Accidents Dataset Analysis and Transformation**
- **Hand-gesture controlled drone**
- **Coffee Bean Crusher 3 Piston Cylinder Pneumatic System.**
- **Analysis of a compound mechanism (4-bar and slider crank mechanism).**
- **Self Balancing Robot.** Implemented a self balancing two-wheeled vehicle using Arduino's ATMega328P microcontroller and MPU6050. Part of the Mechatronics Engineering / Embedded Systems course.
- **LZ Data Compression Using VHDL.** Implemented a data compression and decompression VHDL code using Lempel–Ziv algorithm as part of the Digital System Design Course.
- **HearthStone.** Developed a replica of the famous gameplay HearthStone and implemented its GUI where OOP concepts were used throughout the project. Computer Programming Lab (CSEN 401) course project.

Courses

- Motion Planning for Self-Driving Cars (Coursera)
- Introduction to Self-Driving Cars (Coursera)
- Introduction to Data Science in Python (Coursera)
- Data Analysis Challenger Track (Udacity)

Awards & Scholarships

2018 Partial Scholarship (70%) at The German University in Cairo. Ranked 98^{th} on Egypt's Thanawya Amma (High School) Mathematical Section.

2019 Ranked 5^{th} on Engineering at the GUC. 1^{st} and 2^{nd} semesters.

2020 GUC excellence award. Ranked 2^{nd} on Mechatronics at the GUC. 3^{rd} semester.

2021 Ranked 4^{th} on Mechatronics at the GUC. 6^{th} semester.

2022 Full Scholarship, Bachelor's Thesis Abroad. Ranked 1^{st} on Mechatronics at the GUC. Cumulative GPA over the first 6 semesters.
Ranked 6^{th} on Mechatronics at the GUC. 7^{th} semester.

2023 Ranked 3^{rd} on Mechatronics at the GUC. 9^{th} semester.

Languages and Technical Skills

- Python, ROS1/2, C, Java, OOP, AVR Microcontrollers, ML, Data Science, OpenCV, Raspberry Pi, MATLAB, SOLIDWORKS, AutoCAD, Ansys, MAVLink.
- Familiar with Carla, C++, C#, Assembly, Docker, Proteus, SQL, Socket Programming, Flask, Django.