Omar Ashraf

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LinkedIn | GitHub | Portfolio

OBJECTIVE

Mechatronics Engineer with a deep passion for Data Science and Robotics, seeking a role that leverages my skills in machine learning, data analysis, and robotics innovation. Experienced in Python, ROS, and embedded systems, I excel at transforming complex data into actionable insights and developing intelligent solutions in robotics. Known for creative problem-solving and a commitment to impactful results, I am eager to contribute to a dynamic team driving innovation and growth.

EDUCATION

Misr University for Science and Technology Sep 2018 – Jul 2023

Bachelor of Science in Engineering - BSE

CGPA: 3.66, Excellent with honor

Graduation Project Grade: Excellent

EXPERIENCE

Misr University for Science & Technology Aug 2023 – present

Teaching assistant

- Conducted lectures and tutorials for over 100 students across 4 courses: Mechatronics, CAD, Control, and Robotics.
- Taught concepts including FPGA, VHDL, Assembly Language, mechanical and electrical system modeling, State-space representation, PID control, and analysis techniques like Bode, Nyquist, and root locus plots.
- Provided hands-on guidance to improve students' SolidWorks proficiency.
- Instructed students in developing MATLAB/Simulink models, computing transformation matrices using Denavit-Hartenberg parameters, calculating forward kinematics, and simulating 3D motion for a three-link robotic manipulator using the Robotics Toolbox.
- Designed quizzes and evaluated student performance.

LANGUAGES

Arabic (Native) English (Advanced-C1) "IELTS Test"

TRAININGS

CNC Programming and Operating Mar 2023 – Apr 2023

AOI Training Academy

- Designed and simulated the production of machine parts on Siemens SinuTrain Shopturn and Shopmill, simulating turning and milling operations.
- Produced designed machine parts, leveraging obtained expertise to successfully program and operate Milling 3+2 axis Machines and Turning 4-axis Machines.

SIMATIC Plc Programming Jun 2022 – Jul 2022

AOI Training Academy certified by Siemens

- Learned about the basics of classic control and how to create a classic control circuit simulation using EKTS.
- Learned to program Siemens S7 (1200 & 1500) PLC using TIA Portal and utilized it to develop a miniature production line project.

Aircraft Assembly Sep 2021 – Oct 2021

Arab Organization for Industrialization (AOI)

- K8 Machining and Forming Workshop.
- Quality control systems.

COURSES & CERTIFICATIONS

Automation industrial Applications diploma Apr 2021
JELECOM

Embedded Systems Diploma Nov 2022
AMIT Learning

Python Basics, Python for Everybody, Python Data Structures Nov 2022-Mar 2024
Coursera

Code Foundation for ROS, ROS Basics in 5 Days, ROS Navigation in 5 Days Mar 2023
The Construct

Control Systems: From Mathematical Modeling to PID Control Oct 2023
Control systems made simple
Udemy

Certified SolidWorks Associate (CSWA) Dec 2023
Dassault Systèmes

DataBase Fundamentals Sep 2024
MaharaTech

IBM – Data Science Oct 2024
Digital Egypt Pioneers

PROJECTS

Seed Sowing Mobile Robot (Graduation Project)

- Led the development of a seed-sowing mobile robot for my graduation project.
- Proficiently utilized ROS for seamless outdoor navigation.
  Incorporated a user-friendly 4x3 keypad and a 1.8-inch TFT LCD for interactive input, facilitating the calculation of seed locations within the land area.
- Implemented SLAM technology with lidar and motor encoders, Enabling the robot to dynamically navigate while avoiding obstacles.
- Executed precise seed-sowing tasks with specialized motors for drilling, seed funnel control, and leveling.
- Extending robot functionality to include irrigation processes using components such as a water tank, pump, and valve.
- My responsibilities encompassed the development of the entire electrical circuit, programming in Python for ROS nodes, C for ESP32 and Arduino Mega 2560, and utilizing the Raspberry Pi 4GB as a mini-computer.

Diabetes Guard

- Built Diabetes Guard, a machine learning web app to predict diabetes risk using health metrics.
- Implemented user-friendly interface with Streamlit for easy input and instant predictions.
- Developed interactive data insights dashboard using Dash and Plotly for visualizing feature importance and correlations.
- Utilized Python, Scikit-Learn, Streamlit, Dash, and Plotly, achieving accessible health insights and aiding early diabetes detection with 83% accuracy using RandomForest.

Heart Failure Prediction Project

- Collaborated with a team to develop machine learning models predicting heart failure events using clinical and health-related data.
- Data Features: Various patient attributes including age, medical history, and lab results.
- Models Used: Logistic Regression, K-Nearest Neighbors, Decision Tree, Support Vector Machine,Random Forest.
- Results: Achieved up to 90% accuracy.
- Tools: Utilized Python libraries including NumPy, Pandas, Matplotlib, Seaborn, Scikit-Learn.

Autonomous Navigation(ROS-TB3)

- Utilized slam_gmapping for mapping the environment, implemented amcl for precise robot localization, and developed a service server to record key spots in the map, representing the robot's position and orientation.
- Created a YAML files for adjusting AMCL, local_costmap, global_costmap, and move_base parameters.
- Developed a launch file to initiate map_server, AMCL, and move_base nodes.
- Implemented a Service server, taking a string representing spot labels, and an action client to send goals to the move_base action server.
- Successfully implemented these functionalities on a physical TurtleBot 3, validating their adaptability to real-world robotic systems via the Construct platform.

SKILLS

Technical Skills

- Machine learning
- Data Analysis
- Data Visualization
- Programming with C, Python, SQL
- Linux administration
- Automation (PLC, SCADA, HMI, AC DRIVES)
- Classic control
- Embedded systems (AVR)
- Robot Operating system (ROS)
- Simulation and Motion Modeling
- Autonomous Navigation (slam_gmapping, amcl)
- Control

Software Tools

- Proteus
- MATLAB & Simulink
- SolidWorks
- EKTS
- Indusoft
- TIA V13
- SIMATIC STEP 7
- STEP 7 MicroWIN
- Rviz
- Arduino IDE
- VS Code
- CodeBlocks IDE
- Spyder & Jupyter IDE
- Atmel Microchip studio
- Excel
- Git & GitHub

Soft Skills

- Continuous learning
- Persistence
- Communication
- Adaptability

REFRENCES

All references are available upon request.