

Doha Elhady

Algorithm Engineer

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Education

Sensor Fusion Nano Degree Udacity	Current
Master of Engineering , Electrical and Computer Engineering University of Ottawa, Canada Major: Artificial Intelligence and Robotics	February 2023
Bachelor of Science , Electronic and Communication Engineering Suez Canal University, Egypt	July 2021

Experiences

Algorithm Engineer SEITech Solutions	July 2023- Current Giza, Egypt
<ul style="list-style-type: none">Algorithm Development:<ul style="list-style-type: none">RADAR Platform:<ul style="list-style-type: none">Designed and developed sensor-based ego motion algorithm based on data clustering.Conducted performance evaluations using SIL simulation tools; proposed algorithmic enhancements to improve RADAR tracking accuracy and robustness.Developed C code for performance enhancement algorithms in dynamic object tracking.Ultrasonic Platform:<ul style="list-style-type: none">Engineered perception algorithms for height classification and object clustering algorithms using C++, with strong adherence to object-oriented programming (OOP) principles.Wrote Python scripts to evaluate system results and visualize the sensor output using Numpy, Pandas, Matplotlib, and Seaborn librariesRequirements Engineering:<ul style="list-style-type: none">Implemented software analysis and requirements' engineering using DOORS and DNG platforms.Software Architecture:<ul style="list-style-type: none">Designed software architecture for height classification module for Ultrasonic platform.Modeled software using IBM Rhapsody and refined software behavior and interfaces for tracking and ego motion modules in RADAR platform.Code Quality and Testing:<ul style="list-style-type: none">Performed static code analysis using Helix QAC, ensuring compliance with coding standards and improving code quality.Wrote unit tests to validate core functionality and ensure code reliability.Contributed across multiple stages of the V-model lifecycle, including requirements' engineering, detailed design, software development, integration, and unit testing.Authored knowledge-sharing records and participated in peer reviews to ensure code quality and maintainability.	
Graduate AI Researcher University of Ottawa, Master of Engineering Program	Remote, Canada Feb 2022 – Feb 2023
<ul style="list-style-type: none">Annotated extensive datasets to support object detection and car exterior damage assessment.Implemented image preprocessing and data cleaning techniques using OpenCV, Pandas, and Numpy libraries.	

- Optimized and trained state-of-the-art convolutional neural networks using TensorFlow, Keras, and PyTorch frameworks.
- Assessed model accuracy using structured validation and test sets; oversaw the full development lifecycle from Proof of Concept through Prototype, MVP, Beta, and Final Release.
- Developed and optimized machine learning models using Scikit-learn and Keras, achieving improved predictive performance.
- Employed statistical feature selection methods including Chi-square, Mutual Information, and ANOVA to identify DNS-based data exfiltration patterns.
- Tuned classification models (Logistic Regression, XGBoost, Decision Tree) using GridSearch, and evaluated results using Precision, Recall, and F1-Score metrics.

Publications

Robo-Nurse Healthcare Complete System Using AI

Springer - The 8th International Conference on Advanced Machine Learning and Technologies and Applications (AMLT2022)

Projects

Lidar Obstacle Detection System: developed a custom pipeline to identify vehicles on narrow urban streets using raw point cloud data. The solution incorporated filtering, segmentation, clustering, and bounding box generation, with segmentation and clustering algorithms (Sensor Fusion Nano Degree Project).

Exterior Car Damage Detection System: Developed a deep learning pipeline using CNNs for damage detection, deployed across full product lifecycle (Mentored by Valeo Egypt) (Master's Graduation Project).

Compiler Provenance with Machine Learning: Classified compiler origins by training ML and deep learning models on executable datasets using Scikit-learn and Keras.

Nurse Assistant Robot: Wrote Python code to connect sensors to Raspberry Pi with I2C and built the GUI via Tkinter library and integrated the complete system code and assembled the hardware circuits (Bachelor's Graduation Project).

One Seater Urban Electric Vehicle Embedded System: Wrote embedded C code for PIC MCU to collect sensor data and display it to the vehicle driver. Built drivers for GPIO, ADC, Timer, LCD, 7 Segment, Current Sensor, Inductive Proximity Sensor. Wired the vehicle human machine interface as buttons and LCDs.

Underwater ROV Motion SW System

Prototype of Smart Street & Station

Quadruped Robot

Certificates

Azure IoT Developer Specialty, Microsoft

May 2022

Azure AI Engineer Associate, Microsoft

April 2022

Skills

- **Programming Languages:** Python, C/C++, Bash Script (Linux)
- **Frameworks & Libraries:** TensorFlow, Keras, PyTorch, Scikit-learn, OpenCV, Pandas, Numpy
- **Tools:** Matlab, IBM Rhapsody, DOORS, DNG, Helix QAC
- **Version Control & Workflow:** Git, ALM, PTC Integrity
- **Algorithms & Perception:** RADAR/ultrasonic tracking, ego motion, height classification, clustering, Lidar point cloud processing
- **Computer Vision & ML:** CNN pipelines for object/damage detection, dataset annotation, model tuning & evaluation
- **Languages:** Arabic (native), English (fluent), German (beginner)