Doha Elhady

Algorithm Engineer

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Education

Sensor Fusion Nano Degree — Current
Udacity

Master of Engineering, Electrical and Computer Engineering — February 2023
University of Ottawa, Canada
Major: Artificial Intelligence and Robotics

Embedded Systems Diploma — February 2022
AMIT Egypt

Bachelor of Science, Electronic and Communication Engineering — July 2021
Suez Canal University, Egypt

Experiences

Algorithm Engineer — July 2023- Current
SEITech Solutions — Giza, Egypt

- Engineered perception algorithms for RADAR and ultrasonic sensors, focusing on dynamic object tracking, ego motion, height classification, and clustering.
- Contributed across multiple stages of the V-model lifecycle, including requirements engineering, detailed design, software development, integration, and unit testing.
- Developed height classification and object clustering algorithms within the ultrasonic perception stack using C++, with strong adherence to object-oriented programming (OOP) principles.
- Designed and developed RADAR-based ego motion algorithm.
- Conducted performance evaluations using SIL simulation tools; proposed algorithmic enhancements to improve RADAR tracking accuracy and robustness.
- Performed static code analysis using Helix QAC, ensuring compliance with coding standards and improving code quality.
- Modeled software using IBM Rhapsody and refined software behavior and interfaces.
- Worked on software analysis and requirements engineering using DOORS and DNG platforms.
- Authored knowledge-sharing records and participated in peer reviews to ensure code quality, maintainability.

Graduate AI Researcher — Remote, Canada
University of Ottawa, Master of Engineering Program — Feb 2022 – Feb 2023

- 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.

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)