

# Mark Naeem

## Robotics and Machine learning Engineer

A mechatronics engineer with hands-on experience in industry and research in machine learning and robotics. Very passionate about cognition and making machines smarter and better.



marknaeem@yahoo.com

+447554566842

Glasgow, United Kingdom

marknaeem.github.io/

linkedin.com/in/mark-naeem

github.com/MarkNaeem

## WORK EXPERIENCE

### Robotics Software Engineer - Perception Kingdom Technologies

01/2022 - Present  
Robotic lawn mowers

Glasgow, UK

#### Achievements/Tasks

- Enhanced internal communication between sensors, on-board computers, and actuation modules with CAN networking
- Developed a robotics-specific CI/CD solution
- Deploying perception modules on the running fleet
- Implemented real-time 3D instance segmentation algorithms (on the edge)
- Enhancing current software architecture
- Planning future development for the next iteration of the product

### Machine Learning Research Engineer Uniparticle

09/2020 - 12/2021

Cairo, Egypt

#### Achievements/Tasks

- published a novel result analysis technique in "Bayesian Knowledge Tracing For Assessment Results Analysis" Paper for the national coding competition NCC and improve the competition quality.
- Built a complete system for computerized adaptive testing CAT
- Improved the quality of adaptive quizzes by introducing various probabilistic student modeling and simulation.
- Optimized the running time of the existing adaptive testing simulations algorithms (from 100-120 to 3-5 secs).
- Used Knowledge Space Theory and deep learning-based recommendation systems to build an adaptive learning engine.

### Undergraduate Visiting Researcher Erasmus+ mobility project

06/2019 - 09/2019

Preston, Lancashire, UK

University of Central Lancashire

#### Achievements/Tasks

- Fully funded undergraduate research scholarship from Erasmus.
- Led a team of undergraduate researchers to fully design, simulate, and manufacture RHex robotic platform.
- Main targets: cultural exchange, soft skills, and research skills.

### ASU Racing Team Member

ASU Racing Team, Sussex Ainsams Racing Team

09/2017 - 09/2019

Cairo, Egypt

#### Positions

- **Senior Powertrain Team member - EV FSUK19:** Responsible for battery sizing, cells selection and configuration, Precharge Circuit Design, BMS Selection, Charger sizing, and Wire sizing.
- **Electric Team Member - ICE FSUK18:** Working as an embedded C developer for the engine control unit (STM32F103C8 microcontroller), I implemented *ignition*, *injection timing* algorithms, and CAN bus protocol.

## TOP SKILLS

C/C++

Python

Version Control

ROS, ROS2

Linux, RTOS

Microcontrollers (PIC32, AVR, ARM), Jetson (TX2, nano)

Machine Learning (Tensorflow, Dlib, PyTorch, Keras, Scikit-learn)

PCB Design (Proteus, Eagle, Altium)

CAD, Stress analysis (Inventor, Solidwroks, ANSYS)

## PROJECTS

#### Depth Yolact ROS - ROS package

- A ROS wrapper for yolact instance segmentation with depth image extension for 3D bounding boxes and pointcloud segmentation.

#### "Bayesian Knowledge Tracing For Assessment Results Analysis" Paper (02/2022)

- Publisher: IEEE, Main Author

#### IDeepify - Robust face verification and ID data extraction

- IDeepify is a deep learning-based web service that allows for ID validation for Egyptian documents and fraud detection with liveness detection

#### Swerve Steering Controller in ROS Control- ROS package

- A ROS package to control steering angles and velocities of any given set of wheels with any configurations in a wheeled platform.

#### Move Base Sequence - ROS package

- (Published on ROS Kinetic/Melodic/Noetic) A ROS action server that handles sending multiple goals execution with the move base (navigation stack) action server.

#### Autonomous mobile manipulator for agricultural tasks (fruit picking module) - Graduation project. (09/2019 - 07/2020)

- agricultural mobile manipulator controlled by ROS (Navigation, Visual Localization, and arm manipulation), and deep learning for real-time fruit detection and picking tasks.

#### Linear time-invariant state-space system identification using adam optimization Paper. (02/2020)

- Publisher: IEEE, Main Author

#### D435i stable outdoor VSLAM - ROS package

- A ROS package that modifies the D435i camera configuration and utilises RTABMap for accurate and stable outdoor localization and mapping

## EDUCATION

### Mechatronics Engineering (Class of 2020)

Bachelor of Engineering, Ain Shams University

09/2015 - 06/2020

Cumulative GPA 3.86/4.00

#### Scholarships

- Al-Alfi Foundation  
Scholarship (fall18-spring20)