

# Mark Naeem

Mechatronics Engineer, Robotics and Machine/Deep learning researcher

A mechatronics engineering graduate with hands-on experience in machine/deep learning and robotics. Very passionate about cognition and making machines smarter and better.



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## WORK EXPERIENCE

### Machine learning research engineer Uniparticle

09/2020 - Present

Cairo, Egypt

Achievements/Tasks

- First author in "Bayesian Knowledge Tracing For Assessment Results Analysis" Paper, in which result analysis of the national coding competition NCC was improved using (Bayesian Knowledge Tracing) BKT.
- 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).
- Using Knowledge Space Theory and deep learning-based recommendation systems to build an adaptive learning engine.

### Part-Time Teaching Assistant Ain Shams University

10/2020 - 03/2021

Cairo, Egypt

Achievements/Tasks

- A part-time teaching assistant in Machine Vision course for mechatronics department

### 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.

### R&D Electronics Engineer - 2 months paid internship Fresh Electric

07/2017 - 09/2017

Electric home appliances company

Achievements/Tasks

- Main task: reverse engineering refrigerators' control and interface boards to ease modifications, and error debugging.
- Designing a control circuit for Variable speed compressors.

## TOP SKILLS

C/C++, Python, R, 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, Solidworks, ANSYS)

## PROJECTS

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

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

### 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

### Swerve Steering controller - ROS package

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

### 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

### Catalyst Robot ROS Package

- Making a full ROS package for an old catalyst-5 robot.
- applying different control techniques (position, force, impedance, Admittance)
- linking robot's old PCI data acquisition cards with Ubuntu and ROS.

## EDUCATION

### Mechatronics Engineering (Class of 2020) Bachelor of Engineering, Ain Shams University

09/2015 - 06/2020

Cumulative GPA 3.86

Scholarships

- Al-Alfi Foundation Scholarship (fall18-spring20)

## LANGUAGES

Arabic



English



German

