German University in Cairo
Faculty of Media Engineering and Technology
Deep Learning for Self-Driving Cars
CSEN1094

Task 7: ROS Architecture Design

In this assignment, you are going to design a ROS architecture for an autonomous wheel chair. The deliverable should be a graph like the one we see in RQTGraph in ROS (discussed in the ROS lecture). Use draw.io to draw your graph architecture.

Submission should be a PDF containing the graph archictecture. Make sure that all nodes are annotated and all the subscribers and publishers are also annotated correctly.

You have the following sensors, actuators and modules:

Sensors (Inputs):

- Camera
- Ultrasonic Sensors
- Motor Encoder

Actuators:

- Motor
- Sound Alarm

Modules:

- Obstacle Detection and Classification

  Input: Camera

  Output: Array of detected objects and their locations

- Path Planning

  Input: Camera, ultrasonic sensors and obstacle detection and classification

  Output: Control signals to the motor.

- Obstacle Avoidance

  Input: Camera, ultrasonic sensors, path planning

  Output: Control signals to the motor.

- Emergency System

  Input: Camera, ultrasonic sensors, obstacle avoidance and path planning

  Output: signal to trigger the sound alarm in case of a critical problem

Submission deadline is **Friday 5th of June by midnight**.