

Embedded Systems

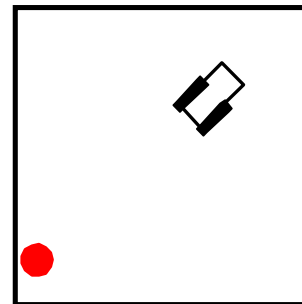
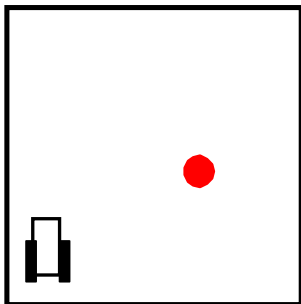
ELEC3020

Lab Assignment 10 – Robot Driving and Object Detection Points: 10

- TEAMS:** This lab will be conducted in teams of 2 students
Note: This lab is compulsory and cannot be dropped.
- EQUIPMENT:** Mobile Robot with Embedded Controller, sensors and motors
<https://roblab.org/eyebot/eyebot32>
- PREPARATION:** Prepare this lab at home by using the *EyeSim* simulator:
<https://roblab.org/eyesim/>

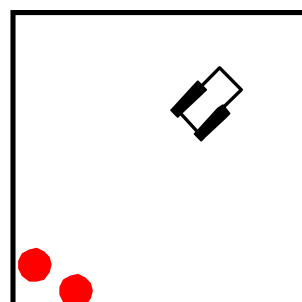
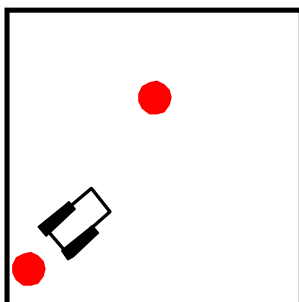
EXPERIMENT 1 (6 points)

This Lab brings together all the experience from the previous lab sessions. Implement a robot program that starts in one corner of the driving area, then surveys the area for a single red can in the environment and brings it back home.



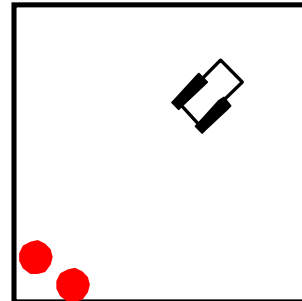
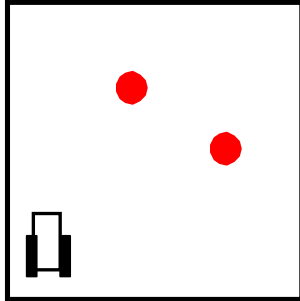
EXPERIMENT 2 (2 points)

Immediately after the collection of one can in experiment 1, place another can at a random spot on the board. The robot should turn around, locate the can and bring it home.



EXPERIMENT 3 (2 points)

Complete the experiment but with two cans placed on the board in relatively close proximity at the beginning of the run.



Tasks

- Let the robot rotate on the spot to explore the whole area
- Search for red cans using the camera
- When a red can has been located, drive around it and push it back towards the robot's starting position ("home area")
- During driving, avoid bumping into walls or obstacles
 - Use PSDs to check left, right and front
 - Display cans and obstacles graphically on the LCD