The University of Western Australia
Dept. of Electrical & Electronic Engineering
Prof. Thomas Bräunl

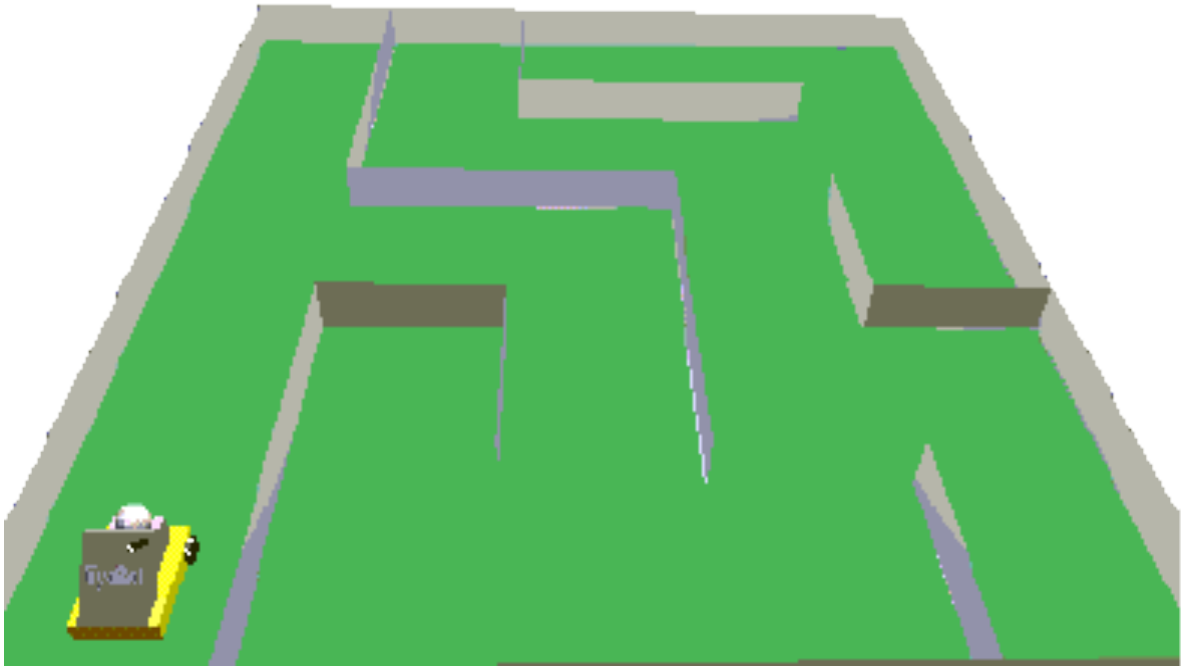
Mobile Robots
AUTO4508

Lab Assignment 7 – *Group* – Mapping **Points: 10**

EXPERIMENT 1 (4 points)

The maze demo program written by your Professor only works in ideal conditions, i.e. in the absence of any deviations in driving or turning operations. Unfortunately, this is not the case in reality. Every sensor reading has a certain error, and every driving operation will be somewhat short of or over the desired distance or angle.

Improve the given maze program by adapting its driving routine, so it can cope with a realistic error margin of +/-4mm for each driving command and +/-2° for each turning command.



EXPERIMENT 2 (6 points)

Write a program that maps any environment, not just a maze, built out of same size square cells.

- For sensing, use the simulated Lidar sensor for this experiment to give you a sufficient number of data points.
  Alternatively, you can use image processing for visual SLAM.
- For the mapping part, you can either adapt the maze program, write your own code, or include a standard SLAM library such as:
  - ORB SLAM
    https://github.com/raulmur/ORB_SLAM2
  - OpenSLAM (visual)
    https://openslam.org/robotvision.html
  - Google Cartographer (Lidar)
    https://opensource.googleblog.com/2016/10/introducing-cartographer.html

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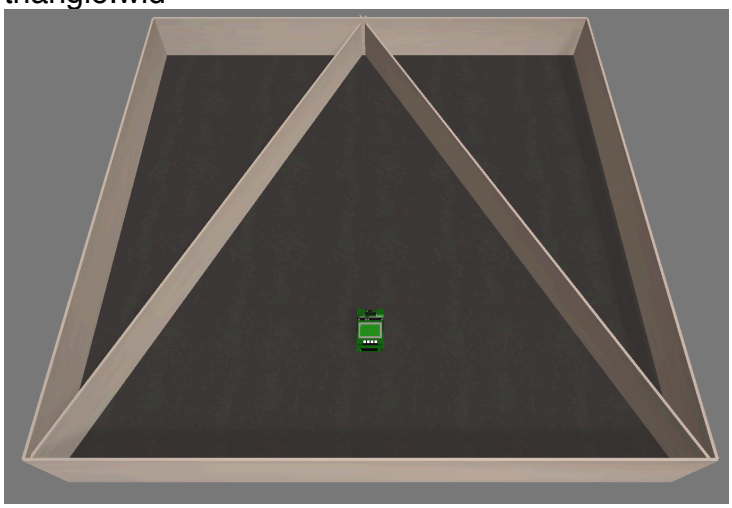

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