Report 3 - Hide and Seek

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Task

The task for this report is the same as the task for the third practical session. Practical sessions 3 - 5 should provide an opportunity to work on your solutions and get help from the demonstrators. This report focuses on discussing your solution, how and why you did it a certain way and presenting the results. The task is to get your robot to play hide and seek, to simplify the problem the task could be split into the following sections:

1. Map the environment - Build up an occupancy grid.
2. Localise your robot - Determine where your robot is within your occupancy grid.
3. Plan your path - Add the ability to navigate to specific points in your occupancy grid.
4. Detect features - Find a 'good hiding spot' and hide in it.
5. Detect differences in the map, ie find a hiding robot.

To simplify the task you can assume that while your robot may be placed at random within an environment, its orientation will be fixed. That is, the robot will be facing in the same direction where ever it is placed in the environment. Since Player allows you to use many different programming languages you are free to use any compatible language. The machines in the ISL are set up to use C++ for Player, we cannot guarantee that we can help you or that it will work with another language. If you choose to use a language other than C++ then **you** must ensure that it works. You may use existing algorithms, for example A*/D* as long as you explain and justify the decision.

Deliverables

This report should be approximately 3000 words and should contain:

1. A description of any algorithms used and a discussion on why they were appropriate for this robot/situation.
2. Commentary on a number of trial runs in different environments.
3. Discussion of the results of a number of trial runs, were they successful? How could it be improved?
4. Evaluation of work done; positives, negatives, hardest parts and what you would do differently.

Each of these aspects will be equally weighted in the marking scheme. The report should also contain a substantial amount of 'evidence' in the form of pictures, graphs, bits of code and any other resources that help to present your solution. Do not underestimate how much value you can extract from the results of experimental runs on the robot, if you think carefully about how you run experiments and how you record your results you can maximize the value of every experiment that you perform. Remember that every time you run an experiment the robot will perform differently, so you should consider running each configuration of the system/version of the controller multiple times.

Write-up and hand-in

You should not write more than 3000 words for this assignment although you may use as many diagrams as you wish to help you explain the decisions that you have made. You may also wish to comment upon possible design options that you chose to reject in order to highlight why you believe the design that you selected is a good one. This work should be handed in **as a PDF** using Blackboard before midnight on **Friday 19th April**. This assignment will make up **50%** of the module marks.

Document History

Version	Date	Author(s)	Description
1.1	Semester 2, 2013	Tom Blanchard	Initial Version
1.2	Semester 2, 2013	Tom Blanchard & Mark Neal	Added Hand-in section and marking scheme.