CISC 3415 Fall 2011, Extra credit

1 Description

This project builds directly on Project 6, turning it into an exercise in using the real Create.

2 Background

1. Prof. Parsons will give you a folder called `extra-credit` which contains a lot of familiar-looking files.
2. The control program here is `roomba-roam.cc`, a throwback to the first project in many ways.
3. However, it also contains some new functions which allow it to get localization data from the camera on the tripod, or rather from the computer connected to the camera.
4. The localization data is a bit limited since it is the location of the robot in the picture taken by the camera. You will have to translate that into a useful location.
5. The robot also has to wear a "hat" to make it easy to see. The laptop will have to be shut for this to work.
6. The location data also only gives you location, so you'll have to keep track of orientation yourself.

3 The challenge

1. The folder `extra-credit` contains a map, `map.txt` which is an approximation to the setup at the back of the room. This is another occupancy grid (though of different dimensions).
2. The challenge is to navigate the Create from the point marked with S in the grid to the point marked with a G.
3. For full (extra) credit, you not only need to come up with a plan, but also have the robot execute it.
4. However, any bits you manage to complete will get you some extra credit.

4 Some help

1. You will need to merge the planning code you wrote for Project 6 into the controller with the calls to the camera (or vice-versa).
2. Note that you will need the version of `build` in the new folder to compile the code — it makes additional calls that are necessary.
3. Once you have a plan, you will need to calibrate. The map is only an approximation, so the distance between waypoints will need to be tweaked.
4. As ever, when we deal with the real robot expect that there will be noise, especially in what the camera gives us.
5. Any version of the controller you want to submit should be sent to Prof Parsons in a file called ⟨**your-names**⟩**-extra.cc**. Be sure to describe what the code does in the comments and, as always, include your names.