Lab01 – Stay within bounds

Introduction:

Infra-Red sensors, in their most basic form, come in pairs. Such pair consists of a sender and a receiver placed adjacent to one another where the sender emits rays and the receiver records the reflection. Objects with different colors reflect different amounts of the emitted IR. This enables us to distinguish between so called “dark or black” and “light or white” colors. Note that ambient light influences the readings of the receiver so be mindful of that when hardcoding your threshold values.

Objective:

In this lab we will use the IR sensors at the bottom of the iRobot, shown in Figure 1, to detect when the robot has crossed the boundaries of the road. The robots will be navigating on grey mats (the road) and will have to stay within bounds of white tapes specifying the boundaries of the road. There are various algorithms you could implement to keep the robots on the road. However, keep the followings in mind when making design choices:

- Time it takes to complete the path (Extra Credit for fastest teams)
- If the tape color is changed, you should be able to change as little as a constant to adapt
- Deterministic state machine (if your algorithm is more complex than just steering manually)

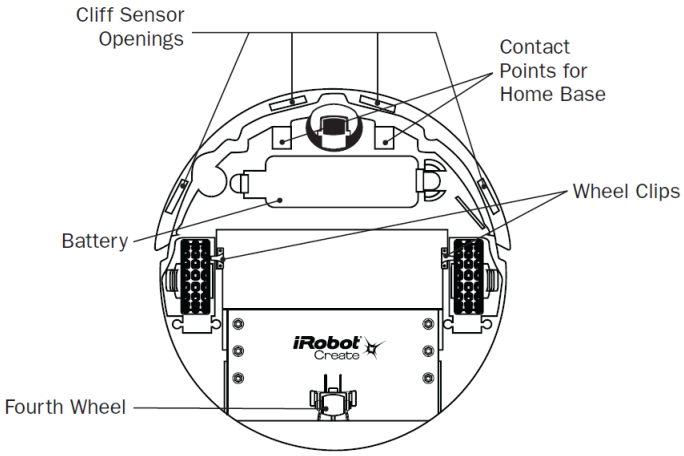

Figure 1: Bottom view of the iRobot

Deliverables:

- State machine of your design (no matter how simple)
- Demo