

# CS 491/691X – Topics: Introduction to Robotics

**Instructor: Monica Nicolescu**

## Lab 8 – Handout

### Harvesting Contest

In this lab you will start preparing your robot for the Harvesting Contest. This contest has two parts. The first part is the Food Collecting. Your robot will wander in the field and count the black pieces of tape (foods) attached to the table in a certain amount of time by using the optosensors. In the second part, Home Searching, your robot should look for its home defined by a strong source of light and go to it using the light sensors.

### Contest Rules:

- a) The two parts will be held together. For the first part, you will count the foods on the table. After this stage is finished, your robot should start looking for home and go there.
- b) For the first part of the contest (Food Collecting) there are total 10 foods on the table. You have 60 seconds to count them. After the 60 seconds have elapsed your robot should start searching for its home. It is against the contest rules to go for home before the 60 seconds are over. We might enforce this by turning on the light source only after the 60 seconds have passed.
- c) You should use touch sensors (to avoid the walls of the arena), light sensors and optosensors (on the handyboard) in your program.
- d) Double counting is not valid. If your robot counts one particular food more than once, it will be considered only one counting. We might enforce this by simply removing the counted foods from the table. Your robot should announce whenever it counts a food (by beeping and printing a message on the LCD screen).
- e) You will be judged on the number of the foods collected in the first part and the time spent to get to the home place in the second part. Your total score will be calculated as follows:

The maximum score is 200 (100 for each part). The robot with the maximum collected food in the first part will get 100 and the robot with minimum food collected will get 50. The others will get scores interpolated between these two ranges according to the number of the foods they collected. For the second part, the robot with the best time (least time) will get 100 and the robot with the worst time will get 50. The others will get interpolated scores in a similar fashion as the first part. The overall score will be the sum of the scores for each part.

- k) The contest will be held during Lab #10, at the beginning of the session. So you have almost two sessions (8 and 9) to prepare for the contest.