Checkpoint #4 Full Function Demonstration

[ICN5406] Mobile Robot 2018

Due: December 7, 2018

- **Purpose:**

The purpose of this checkpoint has two goals. First, making sure that your robot can detect a beacon signal and move towards it. Second, combine all the function together for robot hockey contest.

For this assignment, two infrared diodes will be set up at opposite ends of an arena. Each diode will be emitting light modulated at 38 KHz, but their pulse width are different when received by IR receiver module.

You will need to demonstrate your robot's capabilities under relaxed conditions with no other robots in the arena. The arena will be the actual contest arena.

- **Tasks:**

Demonstrate your robot performing the following actions:

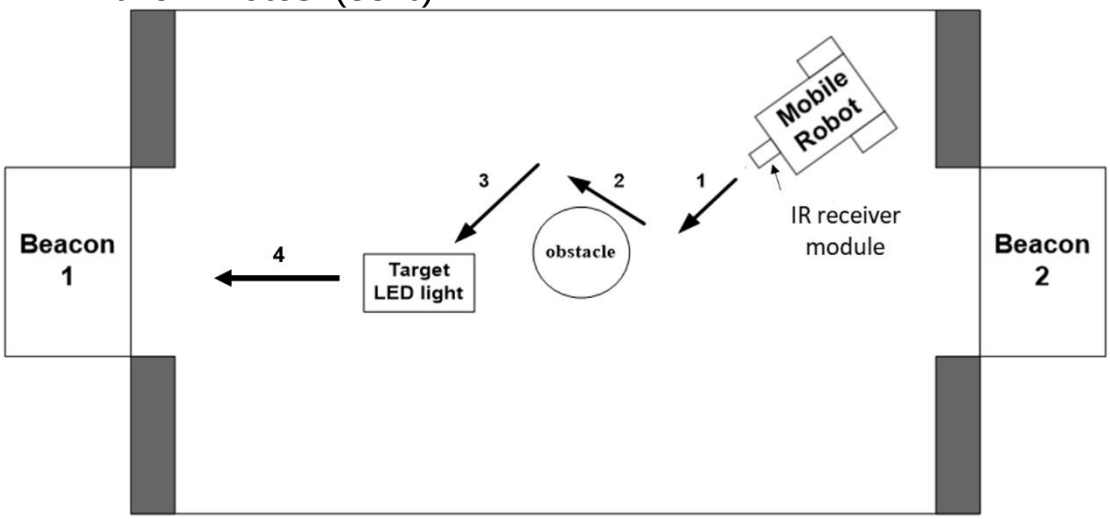
1. Have the ability to avoid all the obstacle in the arena. (20%)

2. Capture the puck. (20%)

3. Your robot should be able to find **<u>two different beacons (Beacon-1 600 and Beacon-2 1500)</u>** and move to the specified source diode in the arena and bring the puck into the goal with Beacon1 and Beacon 2. (25%)

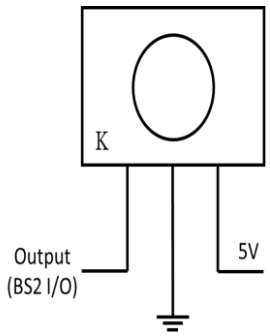
Hint: You can determine two different signals by calculating the pulse proportion in a cycle.

4. Your robot should be able to complete the above route in two minutes. (35%)



- **Materials list:**

	Material	Number
1	PIC-428LM IR receiver	1

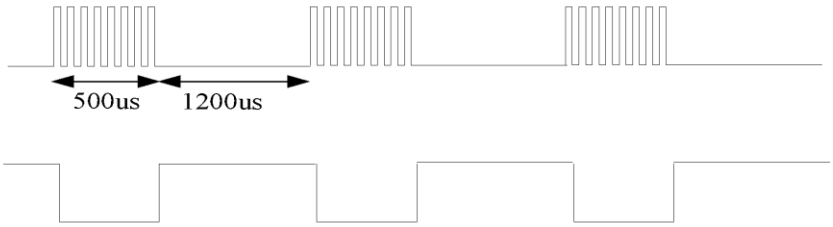


P.S. The distance between Beacon and ground around 10.5cm

● Search Beacon：

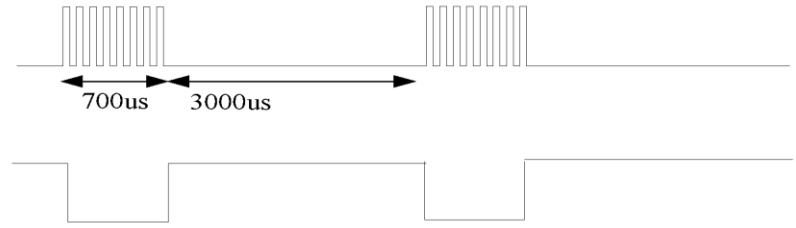
1. Beacon-1 600 (50%)

IR receiver module signal



2. Beacon-2 1500 (50%)

IR receiver module signal



Receive ir data for a period of time and calculate the pulse proportion.

$$\textbf{Ratio} = \frac{\boldsymbol{number\ of\ 0}}{\boldsymbol{total\ data(include\ 0\ and\ 1)}}$$

If your goal door is 1500, the ratio is between 0.17 and 0.22.

If your goal door is 600, the ratio is between 0.27 and 0.32.