

CSU647 – CSG258: SWARM

Assignment 6

Due date: Friday 2/27.

1. Attach and interface a distance sensor to your robot. Your system should allow detecting obstacle when the robot is moving forward and stopping the motion.

You can use the Sharp GP2Y0D02YK0F distance sensor (available in our lab detects obstacles within 80cm). The datasheet is available from the course webpage. The sensor can be interfaced using a pin of the MSP430 that can generate interrupts. These are the pins on Ports 1 & 2. This is similar to how the user push button interrupt is implemented.

Remember to put a 12 or 10KOhm resistor as described in the distance sensor.

First, test each component of the system separately: (1) distance sensor, (2) interrupt response, (3) sensor braking. Then, integrate all the pieces together.

2. Propose a system (i.e., hardware and software architecture) that allows a robot to: (1) follow a wall, (2) go around an obstacle. You can propose your own techniques or do some research on the Internet to find well-known techniques. Your system can use more than one distance sensor with different ranges.
3. Submit a report documenting your code, problems, and solutions. Make sure to clearly indicate the contribution of each team member.
4. Prepare a presentation and demonstration to be given in class (10-15 minutes) to describe your system and progress.

Note: your grades will be based on your individual contributions, your team performance, your code, reports, slides, system reliability, and design creativity.