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| To: | Dr. Berry |
| From: | Christopher Collinsworth, Jordan Patterson |
| Date: | 1/3/2016 |
| Re: | Lab 3 – Random Wander, Obstacle Avoidance |

The purpose of this lab was to develop random wandering and obstacle avoidance behaviors for the robot and integrate them into a subsumption architecture, with layer zero of the architecture consisting of obstacle avoidance behaviors and layer one consisting of the random wander behavior.

Implementation of layer zero of the architecture consisted of two obstacle avoidance behaviors: a collision/aggressive behavior and a ‘run away’/shy behavior. The collision behavior stopped the robot’s motors if an object was detected within 3-8 inches and allowed the robot to resume motion once the object was taken away. The ‘run away’ behavior entailed using distance measurements from four sensors to calculate a repulsive vector. The angle by which the robot turned was proportional to this repulsive vector and allowed the robot to turn away from the obstacle and continue moving.

Implementation of layer one of the control architecture consisted of the random wander behavior, where the robot’s left and right motor speed values were randomly changed every one second. After completing this, layers zero and one were integrated together into a subsumption architecture, resulting in a smart wander behavior.

4.) With only four sensors, we did not create redundant sensing.

6.) We had a few errors with the obstacle avoidance behavior. The sensors not being initially calibrated well resulted in the robot hitting obstacles or stopping prematurely. We also originally had misunderstand the shy behavior, having the robot continually moving and avoiding at the same time.

In conclusion, the robot performed all tasks well during the demo of this lab. With the addition of more sensors, the robot’s performance could be improved though, allowing for better functionality.