Ben & Donald Pre-Lab 2

## Random Wander Psuedocode

/\* random wander will move the robot forward a random distance between 10 and 20 cm, and then turn the robot 15-60 degrees in either direction.  
This function can be looped forever, and will return a 1 if an obstacle is found within tolerance, or 0 if no obstacle is found. \*/

**Fcn: randomWander**

boolean randomWander() {

int randomDistance = random \* 10 + 20

int randomAngle = random \* 45 + 15

goForward (randomDistance)

goToAngle(randomAngle)

// Check if obstacle

If(obstacle == false) {

Return 0

} else {

Return 1

}

}

/\* obstacleAvoidance should move the robot away from the obstacle, with larger changes in speed between the wheels being created by the P controller based off of the change in distance. Currently this does not take into account the idea of trying to avoid obstacles to the left or right

**Fcn: obstacleAvoidance**

boolean obstacleAvoidance() {

while(objectDistance > threshold) {

leftSpeed = baseValue + (idealDistance – actualDistance) \* Gain

rightSpeed = baseValue – (idealDistance – actualDistance) \* Gain

}

}

# Flowchart for a proportional controller with sensor feedback to avoid obstacle behavior

A diagram of a computer program

Description automatically generated

Flowchart for a proportional controller with sensor feedback to follow object behavior

A diagram of a computer system

Description automatically generated

# State diagram for smart wander random wander, collide, and avoid obstacle

A diagram of a warning

Description automatically generated

|  |  |  |
| --- | --- | --- |
| **Input** | **Current State** | **New State** |
| No Obstacle | Wander | Wander |
| No Obstacle | Avoid | Wander |
| No Obstacle | Collide | Wander |
| Warning Close to Obstacle | Wander | Avoid |
| Warning Close to Obstacle | Avoid | Avoid |
| Warning Close to Obstacle | Collide | Avoid |
| Danger at Obstacle | Wander | Collide |
| Danger at Obstacle | Avoid | Collide |
| Danger at Obstacle | Collide | Collide |

# State diagram for smart wander random wander, collide, and avoid obstacle

A diagram of a flowchart

Description automatically generated

|  |  |  |
| --- | --- | --- |
| **Input** | **Current State** | **New State** |
| No Obstacle | Wander | Wander |
| No Obstacle | Follow | Wander |
| No Obstacle | Collide | Wander |
| Warning Close to Obstacle | Wander | Follow |
| Warning Close to Obstacle | Follow | Follow |
| Warning Close to Obstacle | Collide | Follow |
| Danger at Obstacle | Wander | Collide |
| Danger at Obstacle | Follow | Collide |
| Danger at Obstacle | Collide | Collide |