EECS 476 Mobile Robotics
PS 2

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1. Main idea

   To make the given robot smarter, which I think simply means the robot can automatically avoid hitting the barriers. Thus, I do two modification as following:

   1) It originally only rotated to one direction while here I let it randomly switch itself to left or right. This change dramatically gives it much bigger moving area because it won't turn round and round in a corner.

      In *my_stdr_control/my_stdr_open_loop_commander.cpp*

      ```
      yaw_rate = (rand()%100+1)%2 == 0 ? +0.5 : -0.5;
      ```

   2) Use sector scan to replace ping sensing. In the original case, ping is used by ignoring the size of the robot itself which often leads to an embarrassing situation that it stops moving when side parts were stopped.

      In *my_lidar_alar/my_lidar_alarm.cpp*

      ```
      for(int index = ping_index_-200; index <= ping_index_+200; index++) {
          ping_dist_swiped_ = laser_scan.ranges[index];
          ROS_INFO("ping dist swiped No. = %d", index);

          if (ping_dist_swiped_ < MIN_SAFE_DISTANCE) {
            ROS_WARN("DANGER, WILL ROBINSON!!");
            laser_alarm_=true;
            break;
          }
          else {
            laser_alarm_=false;
          }
        }
      ```

2. Example use

To start the simulator with

$ roslaunch stdr_launchers server_with_map_and_gui_plus_robot.launch

Run the alarm function:

$ rosrun my_lidar_alarm my_lidar_alarm

Run a simple, open-loop command sequence with:

$ rosrun my_stdr_control my_stdr_open_loop_commander

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