NOVEL
Weekly Progress Report #3
Raphael Norman-Tenazas, Thomas Keady, Austin Shin
4/17/2019

Weekly Meeting with Project Advisor

Date and location: 4/16/19
Members present: Raphael Norman, Tenazas, Austin Shin
Members absent: Thomas Keady
Topics discussed: progress update and plans for following week

This Week's Goals
Based on our previous weekly report, the goals for this week were:
- **Raphael**:
  - Continue working on the lidar detection node. Write unit tests and get positions from detected objects.
- **Thomas**:
  - Test and refine the node to publish an expected lidar scan from pose data.
- **Austin**:
  - Write the action node that will determine robot's movement to either move away from the detected marker or reorient itself to center the marker in its image (as a way to get better view of marker)

This Week's Progress
- **Raphael**:
  - **Week's Goals Accomplished:**
    - The node works, publishes approximate locations with relatively good accuracy. Works well with multiple objects.
  - **Week's Goals Not Accomplished:**
    - Have not tested in Gazebo and/or real life
- **Thomas:**
  - **Week's Goals Accomplished:**
    - The node to publish expected LIDAR scans based on the known map works and is flexible in terms of the angular and distance ranges it can accomodate.
    - It integrates well with amcl and RVIZ.

- ○ **Week's Goals Not Accomplished:**
  - ■ Tune expected lidar scans in simulation to more closely match LIDAR scans we can expect in the real world.
  - ■ Actually run it in the real world.
- ● **Austin:**
  - ○ **Week's Goals Accomplished:**
    - ■ Written first draft of action node such that robot backs away a hard-coded amount from the detected marker
    - ■ Integrated with amcl_demo launch file for path planning and localization capabilities
    - ■ Runs simulation successfully in RVIZ and Gazebo with our custom robot model (turtlebot with LIDAR)
  - ○ **Week's Goals Not Accomplished:**
    - ■ Have not implemented reorienting action to get a better view of marker
    - ■ Have not tested on actual robot

Changes in Project Scope/Goals

N/A

Lessons Learned

- ● **Raphael**:
  - ○ I learned to re-read the weekly project report format before submitting.
- ● **Thomas**:
  - ○ Launch files are much nicer to play with than I thought. I shouldn't stress about publishing big messages because it happens quickly anyway.
- ● **Austin**:
  - ○

Next Week's Goals

Slightly altered from our project proposal and incorporating our lessons learned, next week's goals are:
- ● **Raphael**:
  - ○ Get code for object detection using LIDAR running on hardware/Gazebo.

- ○ Write node to translate detected_object_array to marker_array for visualization in rviz
- ● **Thomas**:
  - ○ Get code for retrieving expected LIDAR scan running on hardware.
  - ○ Create maps of easily accessible real-world environments for testing on hardware.
- ● **Austin**:
  - ○ Implement specifics for action node
    - ■ Will designate a group of marker id's to run away from and another group to observe more closely
    - ■ Case 1: if robot detected a marker to run away from, find furthest accessible point from marker for robot to move to
    - ■ Case 2: if robot detected marker to get a better look at, send command using move_base to orient robot such that marker is close to center of image
    - ■ Case 3: while robot is moving / rotating to another goal, if different marker is detected, override previous goal with new goal

These goals have been updated due to missing a few testing goals this week. The changes have been *italicized.*