NOVEL
Weekly Progress Report #4
Raphael Norman-Tenazas, Thomas Keady, Austin Shin
4/24/2019

Weekly Meeting with Project Advisor

Date and location: 4/23/19
Members present: Raphael Norman, Tenazas, Austin Shin, Thomas Keady
Members absent: none
Topics discussed: progress update and plans for following week, importance of getting hardware working

This Week's Goals

Based on our previous weekly report, the goals for this week were:

- **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

This Week's Progress

- **Raphael**:
    - **Week's Goals Accomplished:**
        - Tested and bug fixed lidar node in Gazebo

        - Updated simulation launch file to include node and remap topics properly
        - Wrote node to publish TFs from robot to detected objects
    - **Week's Goals Not Accomplished:**
        - N/A
- **Thomas:**
    - **Week's Goals Accomplished:**
        - Get code for retrieving expected LIDAR scan running on hardware.
        - Create maps of easily accessible real-world environments for testing on hardware.
            - Created launch file to quickly and easily do this
        - Tune expected lidar scans in simulation to more closely match LIDAR scans we can expect in the real world.
    - **Week's Goals Not Accomplished:**
        - N/A
- **Austin:**
    - **Week's Goals Accomplished:**
        - Written action node with three different case as stated in above section
    - **Week's Goals Not Accomplished:**
        - Have not tested on hardware

Changes in Project Scope/Goals

N/A

Lessons Learned

- **Raphael**:
    - Small errors in rotation lead to large errors in detection. I think we will have to do some phase matching to improve this.
- **Thomas**:
    - It's probably best to do a continuous integration-type strategy with hardware.
- **Austin**:
    - ar_track_alvar does not publish confidence in marker classification. Confidence is always 0, I think it isn't actually implemented yet

Next Week's Goals

Slightly altered from our project proposal and incorporating our lessons learned, next week's goals are:

- **Raphael**:
    - Improve localization
    - HARDWARE TESTS
- **Thomas**:
    - Identify and if necessary fix possible bug in real-world navigation launch file
    - Integrate other nodes into real-world navigation launch file
- **Austin**:
    - Test ArUco marker detection on hardware
    - If we construct a map of the room we plan to use, then also test the action node on hardware
        - Need to especially test if path will change if new marker detected while executing a path

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