Progress Review 3

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Team B / Auto Pirates

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1. Individual Progress

I've been working on stage simulation this week. Tushar created an occupancy grid map and shared it with me. I changed map in the world file in STAGE simulation setup. I could get the below simulation environment like perspective view (Figure 1) and 2D view (Figure 2) of STAGE simulation. So far, we didn't consider the scale of map and autonomous boat model reflecting physical dimensions.

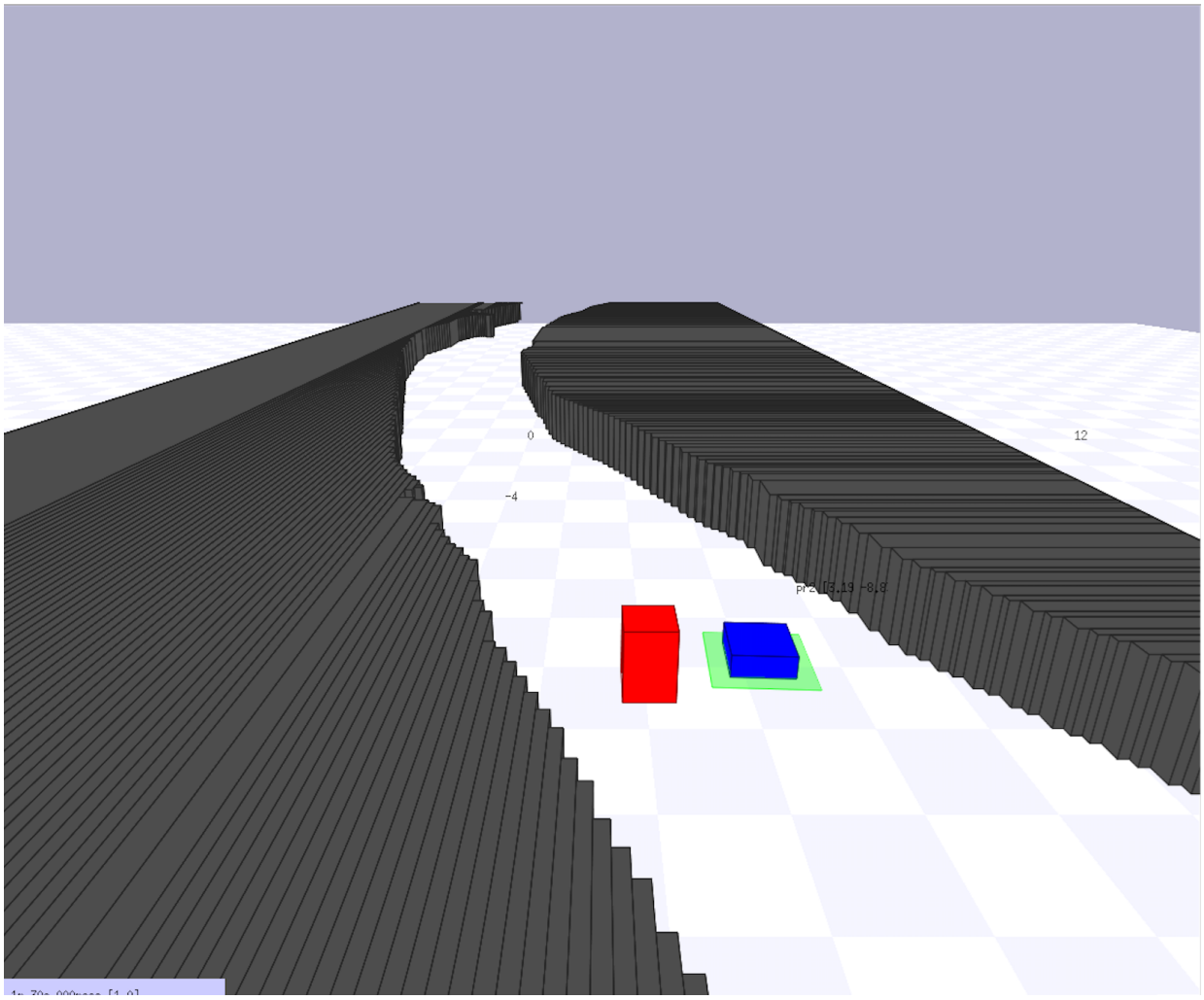

Figure 1. Perspective map view of Stage

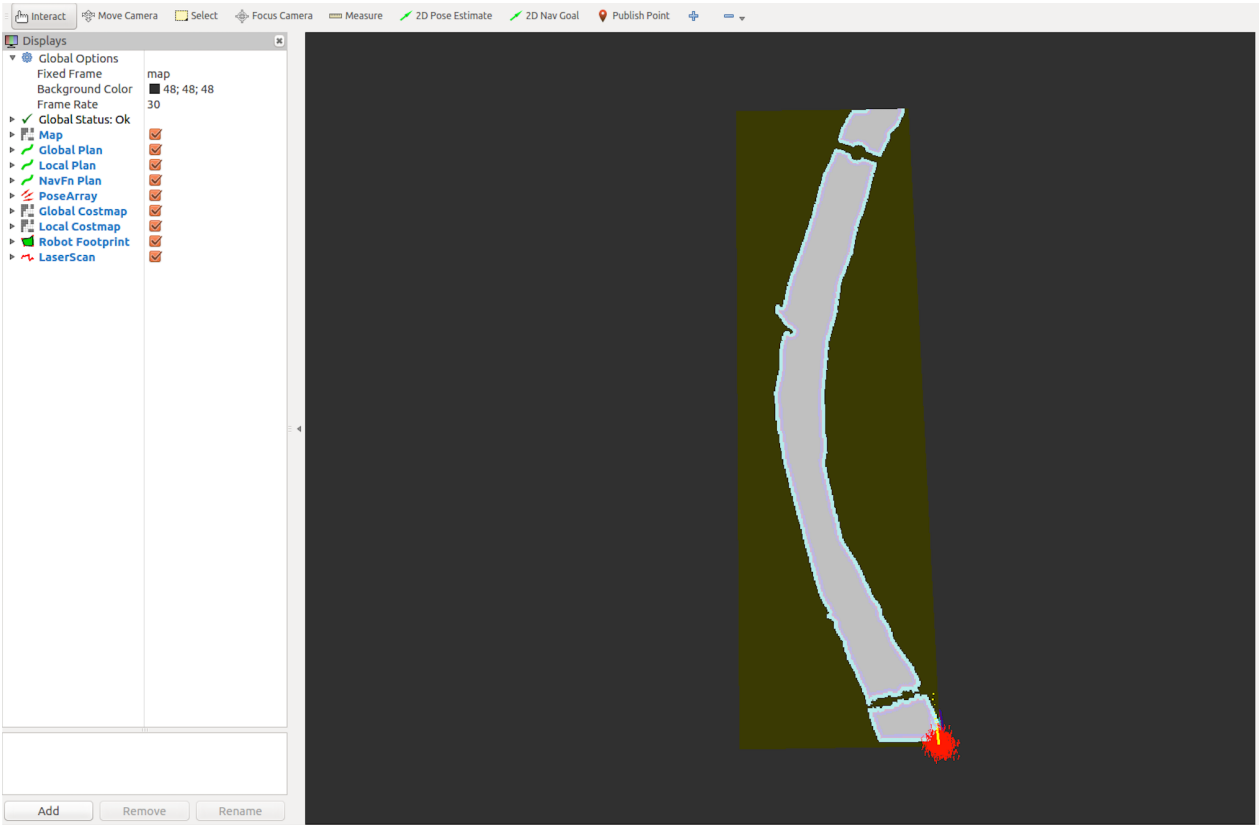

Figure 2. 2D map view in the rviz.

Next, I tried other stage simulation provided in ROS package. There are not enough specific tutorials and documents of the Stage simulation. What I could do was that I referred to several other setup files in simulation packages using the Stage. Specifically, I tested navigation-tutorial package. Upon testing it, I was wondering if the SBPL package was used in common navigation packages. STAGE simulator is using navfn as the default package for navigation (includes planning algorithms) rather than SBPL package. I clarified this from the researcher working at SBPL lab. I got to know that I should change the path planning to use local planner plugin API from the SBPL software researcher. For this reason, I needed to resolve this issue next week.

Lastly, I worked on making our own simulation ROS package, recboat_simulation, which covered occupancy grid map, autonomous boat model, and launch files. I started to gather setup files of other robot simulation package, which help other team mates to catch up how the stage simulation works and how we can integrate our environment with STAGE in the best possible way.

2. Challenges

As I mentioned in my individual work, I had difficulty in grasping the structure of STAGE simulation package. STAGE simulation packages required several other packages. I studied the information about required packages by reviewing package documentation and tutorials.

Second, our team was supposed to do field test today. As today weather was windy and driver cancelled the field test for safe consideration, we couldn't do field test this morning. I guessed that field test would be tougher than I expected. I thought that I should prepare some testing software for smooth test progress.

Lastly, as our team had insufficient information of kinematic features of the boat, I emailed for boat manufacture. I expected that we could know some technical features of boats like maximum allowable steering angle at certain speed.

3. Teamwork

1) Shiyu Dong: Shiyu worked on PCB layout and camera configuration for field test.

2) Bikram Hanzra: Bikram worked on filtering, improved code base and wiki of the project.

3) William Seto: William worked on visualization of the radar data.

4) Tushar Chugh: Tushar did design the PCB layout and worked on occupancy grid map for the simulation.

4. Future Plans

First, our team plans to do field test on Tuesday. We're expecting to test some basic throttle and steering and waypoint functions. Based on test data acquired in field test, we could evaluate the performance of boat and accuracy of sensors, GPS and IMU, in the boat.

Second, I plan to resolve the sbpl-lattice-planner package compile errors and integrate it into navigation package. As sbpl-lattice-planner package is for ROS hydro version and is not

maintained, there would be some technical issues. I would resolve these issues through asking those for SBPL lab.

Lastly, as we didn't consider the scale of map and boat model, I thought that the job to adjust map and model to the scale was important for our path planning simulation. I'll do this job next week.