PROGRESS REVIEW #12

INDIVIDUAL LAB REPORT [ILR11]

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INDIVIDUAL PROGRESS

This week I worked on the bugs which I mentioned in the last ILR related to 'number of waypoints to be missed' and to indicate when boat has reached the goal. Here is the summary:

a. Number of waypoints to be missed:

Problem: As explained in the earlier ILR's, we have to miss the first few way-points given by the planner. The reason for this is the planner takes time to plan the new path and the initial way-points which it gives lies behind the location of the boat (as boat is no longer at the same position). Now, as we have added the new costs in the map, sometimes it even take 5-12 seconds to plan the path. In these cases, 1 or 2 new way-points are located behind the boat and because of this, the boat takes a U-turn to reach them.

Solution: Figure 1, shows the problem wherein the initial waypoints lie behind the boat. (Note: there was a time delay in taking the screen shot, so boat was not that far away as shown in figure). To solve this problem I did the following:

a. Got the new location of the boat

b. Calculated the distance from the start to the waypoints

c. Got the minima from the collection of the distances calculated in step b. Figure 2, shows the distances and the minima is marked with red arrow.

d. Cleared the waypoints which were appended before the minima. In this case, the number of waypoints to be missed is 8.

Figure 1: Visualization showing path which starts from the behind the location of boat

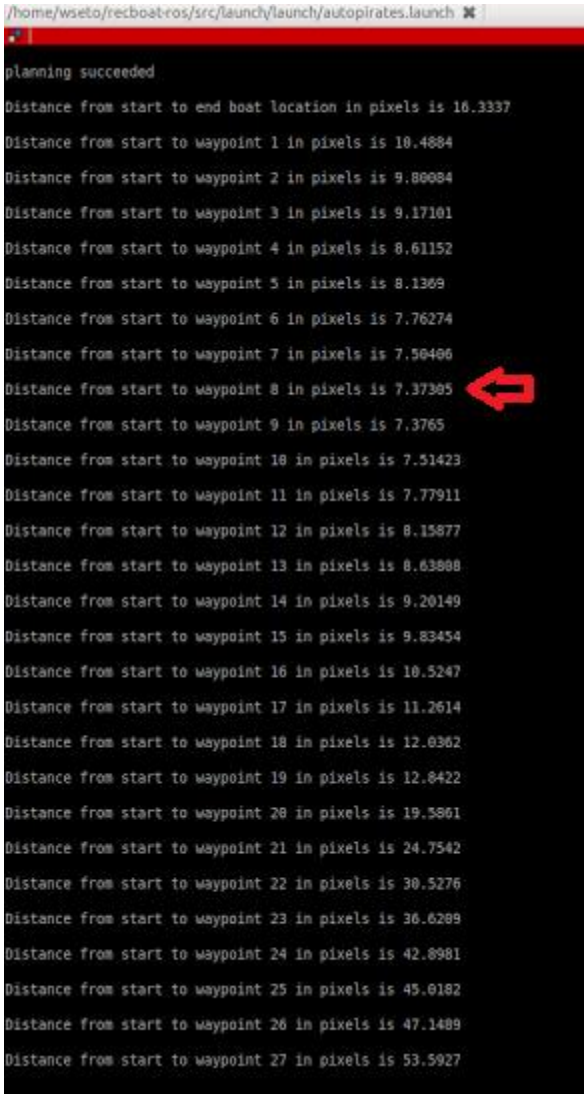

Figure 2: Distance from new start location to waypoints

We would be testing this feature during the field test tomorrow. Testing U-turns and turns around the fountain (near PNC park) would be very crictical.

b. Notify when the boat arrives at the goal:

For this I just had to calculate the distance between the start and the goal locations. If the distance computed is less than our decided threshold (15 meters) then the message is published that boat has reached the goal. Also, a message is sent to the low level controller to make the boat stop.

c. Website Update

I also updated project website which included following: ILR's of all team members uploaded, standards & regulations presentation uploaded, Spring Validation Experiments (SVE) test plan

1-page version uploaded, schedule updated, Issues Log & Risk Chart updated, Media page updated showing latest videos.

CHALLENGES

a. **Number of way-points to be missed**
   Before I could implement the solution, I had to deal with the issue that our system is single threaded. Callbacks are processed at the end of each planning loop so in order to get the latest location of the boat, we have to process the span_pose callback before checking for waypoint skipping. After I did this, I had to check to make sure this didn't cause any problems with things being updated in the middle of the loop.

TEAM WORK

All of us went for the field test and other than that our team worked on the following:

a. **Shiyu Dong:** Shiyu worked on adding a velocity display to the GUI and routes for the destinations. He also integrated GUI with planner.
b. **Bikram Hanzra:** Bikram worked on adding synthesized voice messages to the GUI in order to improve the user experience.
c. **Tae-Hyung Kim:** Tae-hyung worked on analyzing stored data received from Novotel Span INS sensor and testing ROS package using rosbag file.
d. **William Seto:** William worked on improving the inflation of the obstacle costs, by inflating them in an elliptical shape. He also helped me in debugging the 'number of waypoints to be missed' feature

FUTURE WORK

a. **Testing the features**
   - I have to test both 'number of waypoints to be missed' and 'notify when the boat arrives at the goal' features.
b. **Field Test 7**
   - We would be having our next field test on 14th April 2016. This would also be the dress rehearsal for the SVE and hence it is very important for this field test to be successfully. I will have to fix the bug coming in the planner/ruled of the road/waypoints related features that we might encounter during the field test.
c. **Website Check:**
   - I also have to update the website for the final website check which is scheduled at the end of this month.