Autonomous Mobile Robots

Consolidation Report

Team - 07

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Task 1 : Motion Controller

Procedure:

Differential Drive: check if the robot reaches the goal position using differential drive, without changing the orientation
start position: x = -6.5 y = -6.5 yaw = 45 degrees
goal position x = 5 y = 5 yaw = 45 degrees

Omni Drive: check if the robot reaches the goal position using omni drive with change in orientation
start position: x = -6.5 y = -6.5 yaw = 45 degrees
goal position x = 5 y = 4 yaw = 0 degrees

Velocity Profiling: check if robot follows necessary velocity profile.

Results:

Test Cases	Differential Drive	Omni Drive	Follows Velocity Profile
Kishaan	Perfect	Position reached	No noticeable deceleration at the end
Vajra	Perfect	Position reached	No deceleration at the end
Vladimir	Perfect	Position reached	Decelerated at the end

Conclusions : All of the tested motion controllers behaved similarly during our testing procedure, Vladimir`s velocity profile looked better near goal.

Task 2 : Wall follower

Procedure:

Case 1: Handles convex corners

Case 2: Handles concave corners

Case 3: Is robot able to complete the whole map

Case 4: Works for both worlds

Results:

Test Cases	Case 1	Case 2	Case 3	Case 4
Kishaan	Yes	Yes	Yes	Yes
Vajra	Yes	Yes	No	No
Vladimir	No	Yes	No	No

Conclusion:

Based on our observations the only wall follower code that was able to complete at least one map is Kishaan`s, although movement is a bit jerky.

Task 3 : Bug2

Procedure:

Finding goal in simple environment:
test the code with goal point (x=1 y=1)

Finding goal in complex environment:
test the code with goal point (x=-5 y=-5)

Unreachable goal:
test the code with goal point (x=-4 y=4)

*Yaw value for all test cases is 0

Results:

Test Cases	Finding simple goal	Finding complex goal	Finding unreachable goal
Kishaan	Yes	No	No
Vajra	Yes	Yes	No
Vladimir	Yes*	Yes*	Yes*

*with help if robot crashes into the wall

Conclusion:

Due to ambiguous behavior of wall follower provided in binaries in certain situations it was rather hard to judge how well code worked, as you must mover robot manually so that is does not crash into the wall. All in all

Vladimir's code was using binaries wall follower, Vajra’s code was using her own wall follower and Kishaan’s code was using binaries and code for detecting unreachable code was missing in his code.

Based on our observations and test results we conclude that Vladimir’s motion controller, Kishaan’s wall follower and Vladimir’s bug2 should be pushed to the team repository.