Implementation of a Robot Behaviour Learning Simulator

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An Overview.

On our last meeting on 8th April, we discussed the expectation from the next meeting. Tasks were given, such as

- I had to do a succesfull simulation of one robot.
- I had to record the activities in a log file and present.
- I had to make the GUI for the robot so that it could spawn up different worlds and different robots.

Simulation in Gazebo

Retrospective

- In our last meeting, I introduced the idea of using containers for deployment. I faced difficulties in using the container as I never used it before the project. I spent close to 2 days struggling with it's issues.
- There are differences in between various ROS versions that are released every 2 years, development speed would've been better if ROS was backwards compatible like Java.

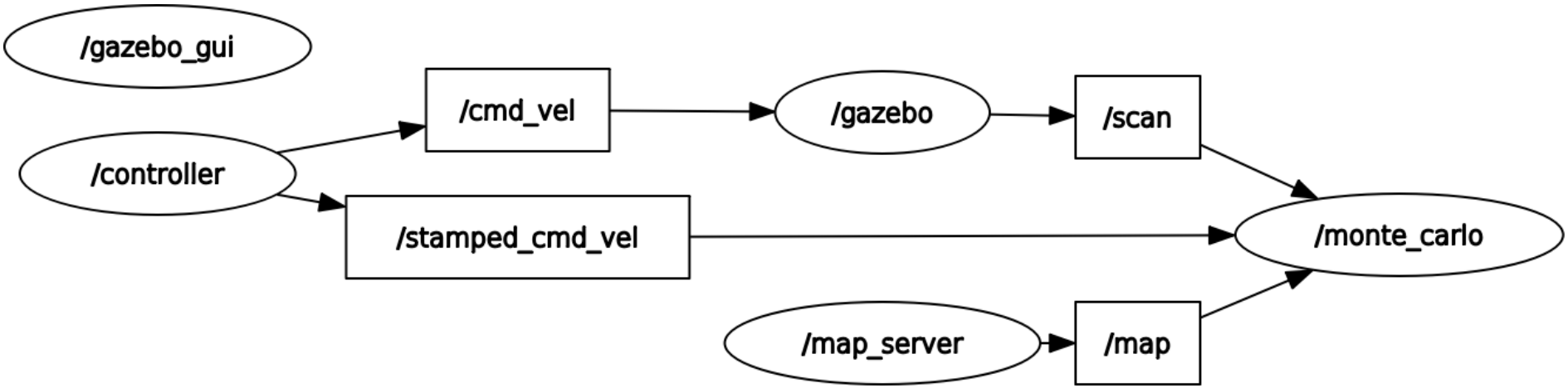
Simulation in Gazebo

I will present a simulation of one robot (turtlebot3) in our case, in a world (the simulation environment) in Gazebo. I have implemented the Monte Carlo Localization Algorithm which works on optimizing the nearest weights with the highest probabilities, thus deciding the destination of the robot.
The simulation was ran for 30 minutes by me, and I recorded the log file for each and every node. Unfortunately, I was not able to convert the .bag file format to .csv/.json/.xml due to the software I found for such were using deprecated packages in python. I will try to do it, or I can send the .bag file itself whatever is required.
Let's see the simulation now.

Questions

- What are the expectations from the UI? Is there any preferred way to which I should build it or if it should be simple and minimalistic?
- The end robot in which we are targeting the simulation software, what is it? Is it a turtlebot3 or a turtlebot2, as there are OS based complications in between both.
- In the end robot, what kind of mini-PC board we have?
- Are we employing a LIDAR sensor? and if yes, what other sensors are we employing in the turtlebot?

RQT-Graph


/gazebo_gui
/cmd_vel
/gazebo
/scan
/controller
/stamped_cmd_vel
/monte_carlo
/map_server
/map

Thank You!