

ROS/Gazebo Keyboard Input

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Sprint 3 Documentation of Work

Objective of Research

The objective of this investigation was to find a ROS compatible method of controlling a simulated vehicle with keyboard input. This would allow us to facilitate the creation of the teleoperational car in the simulation environment that the user navigates for the autonomous vehicle to follow.

Findings of Research

There are two straightforward ways of doing this: using the teleop_twist_keyboard ROS node in a Gazebo motion plugin and creating my own plugin.

The biggest advantage of using the teleop_twist_keyboard plugin is fairly plug and play, but that seems to be a bit of a downfall for it as well as it is not configurable. It requires that the user uses the i, j, k, and l keys to navigate (along with a few other options) and any changes to angular or linear speed have to be done on the fly as opposed to starting out with what we deem appropriate for the simulation. I feel that this may pose issues with user error as it is not particularly intuitive and could confuse a user while the simulation is running.

The other option is to make our own teleop movement node to listen for the specific key presses and react accordingly. In ROS, the robot you are looking to manipulate will generally take commands for linear and angular velocities and it would, in theory, be straightforward to have velocities of our choosing tied to these key presses that we are able to tune to the values we deem appropriate for our use. While this is clear-cut, it would not be trivial either.

Research Conclusion

In conclusion of this research, I feel it would be best to use the teleop_twist_keyboard node to pilot the teleoperational vehicle. What it lacks in customizability, it makes up for in a number of options that would be more difficult to implement than traditional movement such as changing control schemes and controlling maximums for angular and linear speeds both together and separately that would otherwise take time away from other areas of the project.