Final Report

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The goals for this study were put in the form of Tasks. The first task given was to successfully download Ros2 and have that running properly with Webots R2021a. Then I was to implement Lab 3 Task 2 from the previous class, Control of Mobile Robots, with Ros2 so that it could do all the logic in Ros2 rather than Webots. The second task was to make the prebuilt ORB_SLAM2 work with the Ros2 Webots connection we have made.

By our late spring break I had completed the implementation of Lab 3 Task 2 with the Ros2 Webots connection. The robot is fully capable of moving throughout the 4 cylinder world we have been given. Though my robot cannot successfully navigate the multiple cylinder world, it originally could not do it when the logic was only in webots either. The resulting pace of my robot is much slower and the code to enable this is more complex due to two errors. With the new implementation there is no use of while loops and no message large enough to send all the data between the two files. Zachary split off to research the while-loop issue while Noah researched making his own message type to send over more cylinders. Their findings for each of those issues will most definitely be in their reports as it was their work. These errors do not deny that the task was a success. After a busy spring break I attempted to get headway on Task2 so that the others could have less to do once they are done with their specific things. Ultimately I found a github that promised to do a Ros2 node wrapping for ORB_SLAM2. Due to many new errors and redownloads I am at the last line before the build is complete, with an error I do not know how to fix. I have created a 20 minute video so that anyone with Ros2 Foxy may catch up and be right where I left off.

Technology is constantly being updated and renewed as time moves on. The ORB_SLAM2 repository is 2-4 years old in some of their files while the repositories it requires are relatively new. The changes have supplied new errors to be experienced. Luckily the internet is a large place where if you search hard enough most things have been answered. However, I have not yet found the current answer to the problem at hand. The error is shown in the video and in my lab documentation. The links to the videos and github are attached at the bottom of the final report. This may be a very simple fix for some fresh eyes. Everything I am doing or have done this semester is brand new to me, so I do believe there is a solution that can be found by the next person to pick this up. Once someone does have it built correctly, they must prepare a

way to link the ORB_SLAM2 to our Webots world and have it run. Because of the documented error I have not been able to reach that point yet.

Links:

Github for Task1, Lab Reports, and links to videos:
https://github.com/treevor34/ROS2_Lab3_Webots

Video to Task1:
https://youtu.be/ROYxgTzI5XQ
or
https://youtu.be/gq5sP1f9Mjo

Video to Task2:
https://youtu.be/eL1CGIzoOSY