**Debugging (04/25/19)**

The following guide is representative of the system as of the date above. Methods are subject to change as the system changes.

“I can’t connect to either Pi”

* Plug each one in manually to a computer monitor and check that they are connected to the same network you are
* Attempt to ping the Pis via their addresses on your network. This can be checked by using *ifconfig*

“RViz, RQT, etc.. can’t connect to my Pi / I can’t see any data”

* Most of the time this happens when one Pi is not connected via WiFi to your network.
* You’ll find that the nodes run on that Pi will not be seen in the RQT graph.

“My robot won’t localize itself after moving”

* This is an in depth problem, as there can be many sources of error. AMCL is what allows the robot to determine where it is in the global space. It uses primarily the laser scan data and the odometry (encoders). Ensure both of these are outputting what you would expect with *rostopic echo*
* Ensure you define the correct initial position in the *amcl\_diff.launch* file. Don’t forget the orientation (in radians)

“The robot won’t go to the correct spot I defined”

* Ensure the position you defined is actually within the map space using RViz.
* There are currently a number of bugs with the navigation stack to be worked out. Using the move\_base nodes that use costmaps seem to have the most trouble with navigation

**Known Bugs**

* Move\_Base node is still sporadic and a primary cause of being unable to navigate the space
* The /pid\_velocity nodes are currently untuned, so they have been changed to a static range of 20%-50% in motor power terms. (The robot overcomes the power of inertia at 20%) This should be fixed at some point to allow the robot to be more accurate
* AMCL sometimes will lose its position if it does not move for an extended period of time