Architecture documentation for Odometry Sim

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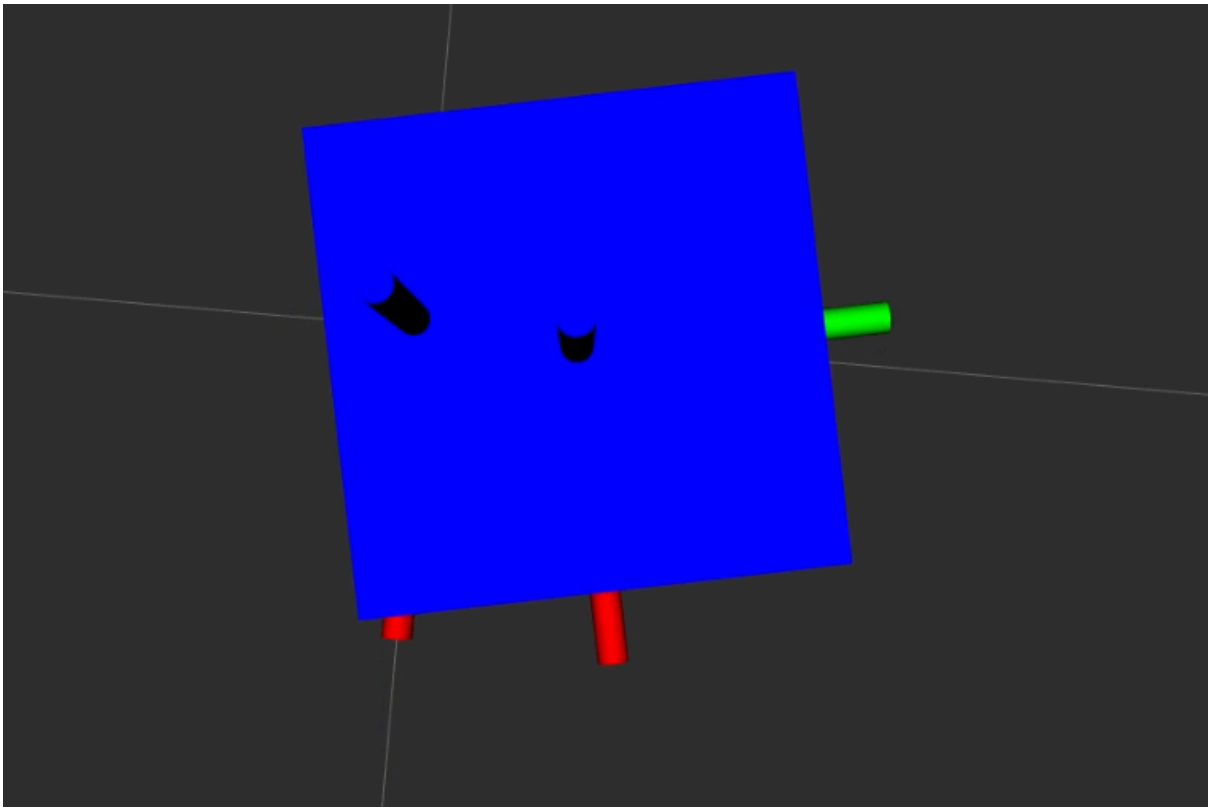
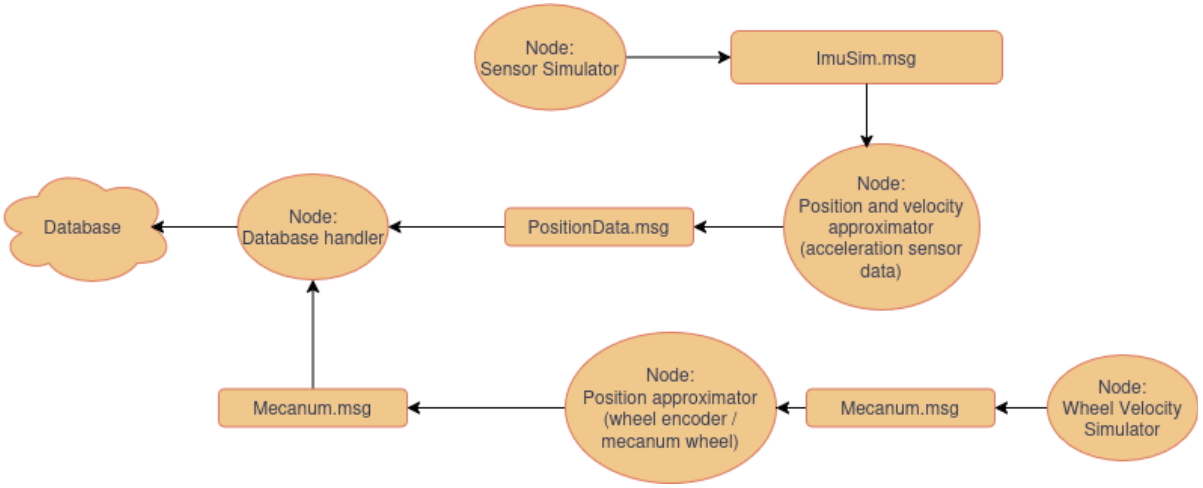


This documentation shows the architecture for "Odometry Simulation”.
For node documentation, check the designated files per node in the “node-documentation” folder.

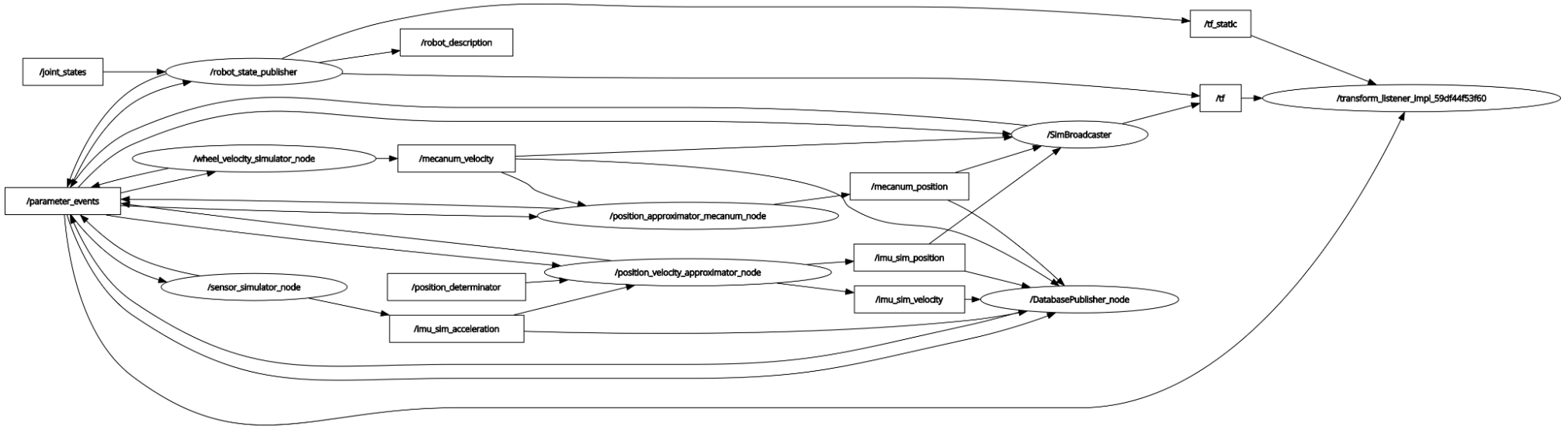
CONTENTS

Architecture

Flowchart



rqt_graph



Notably, the graph includes nodes and messages for rviz.

The flowchart and graph shows the simulator nodes sending messages to the approximator nodes and all nodes sending messages to the DatabasePublisher.

Specifically the mecanum approximator sends position approximations to rviz via the topic /tf.

Messages

g425_assign4_interfaces_pkg/msg/Mecanum.msg

```
# angular velocities mecanum wheels
builtin_interfaces/Time stamp
float64 wfl  # velocity front left wheel in radians per second
float64 wfr  # velocity front right wheel in radians per second
float64 wrl  # velocity rear left wheel in radians per second
float64 wrr  # velocity rear right wheel in radians per second
```

g425_assign4_interfaces_pkg/msg/ImuSim.msg

```
# accelerations from IMU_simulator
builtin_interfaces/Time stamp
float64 x
float64 y
float64 z
float64 yaw_z
```

g425_assign4_interfaces_pkg/msg/PositionData.msg

```
# position data can be used to define the robot's pose in a given frame
builtin_interfaces/Time stamp
float64 x           # x position in meters, horizontal direction
forward

float64 y           # y position in meters, horizontal direction
sideways

float64 z           # z position in meters, vertical direction upwards

float64 yaw_z       # orientation in radians, "yaw". (this means
angular rotation pointing upwards from origin turning CCW when looking
from origin)
```

Nodes

Check the “node-documentation” folder.