

Lidar

Lidar is a surveying method that measures distance to a target by illuminating the target with laser light and measuring the reflected light with a sensor.

Lidar plugin

<!--add lidar-->

```
<link name="hokuyo_link">
  <pose>0 0 0 0 0 0</pose>
  <collision name="collision">
    <pose>0 0 0.3 0 0 0</pose>
    <geometry>
      <box>
        <size>0.1 0.1 0.1</size>
      </box>
    </geometry>
  </collision>
  <visual name="visual">
    <pose>0 0 0.27 0 0 0</pose>
    <geometry>
      <mesh>
        <uri>model://hokuyo/meshes/hokuyo.dae</uri>
      </mesh>
    </geometry>
  </visual>
  <inertial>
    <mass>0.016</mass>
    <inertia>
      <ixx>0.0001</ixx>
      <ixy>0</ixy>
      <ixz>0</ixz>
      <iyy>0.0001</iyy>
      <iyz>0</iyz>
      <izz>0.0001</izz>
      <!-- low inertia necessary to avoid not disturb the drone -->
    </inertia>
  </inertial>
```

```

<sensor type="ray" name="laser">
  <pose>0 0 0.3 0 0 1.57</pose>
  <visualize>true</visualize>
  <update_rate>10</update_rate>
  <ray>
    <scan>
      <horizontal>
        <samples>1024</samples>
        <resolution>1</resolution>
        <min_angle>-3.141593</min_angle>
        <max_angle>3.141593</max_angle>
      </horizontal>
    </scan>
    <range>
      <min>0.1</min>
      <max>30</max>
      <resolution>0.1</resolution>
    </range>
    <!-- <noise>
      <type>Gaussian</type>
      <mean>0.0</mean>
      <stddev>0.01</stddev>
    </noise> -->
  </ray>
  <plugin name="hokuyo_node" filename="libgazebo_ros_laser.so">
    <robotNamespace></robotNamespace>
    <topicName>/spur/laser/scan</topicName>
    <frameName>/hokuyo_sensor_link</frameName>
  </plugin>
</sensor>
</link>

<joint name="hokuyo_joint" type="fixed">
  <pose>0 0 0 0 0 0</pose>
  <parent>iris::iris_demo::iris::base_link</parent>
  <child>hokuyo_link</child>
</joint>

```

Add this to your world file under iris or

```
cd ~/catkin_ws/src  
git clone https://github.com/Intelligent-Quads/iq_sim.git
```

This repo has a world file with lidar and camera. To launch it type
`roslaunch iq_sim lidar.world` .

This will launch lidar and a ros topic where lidar is publishing to.

Topic name: `/spur/laser/scan`

Message type : `sensor_msgs/LaserScan`

Tips

The light rays are spread from the -y axis.

Which means , `lidar_msg.ranges[0]` gives the range of -Y axis.

Also there is a difference of 0.5 between range and actual position.

So if lidar reads 1.32 the actual position is 1.815. Take into account this too.

Also `<samples>1024</samples>` means 1024 light rays are emitted and detected.

So in order to determine the position if `lidar_msg.ranges[i]` gives a different value,
 $\pi*i/1024$ is the angle with respect to -Y axis.