

Book Ex. Urdf

```
<?xml version="1.0"?>
```

```
<robot name="One-DOF-Robot">
```

```
<!-- Used for fixing Robot to the simulator's world frame-->
```

```
<link name="world"/>
```

```
<joint name="glue-Robot-to-world" type="fixed">
```

```
<parent link="world"/>
```

```
<child link="link1"/>
```

```
</joint>
```

```
<!-- Base link -->
```

```
<link name="link1">
```

```
<visual>
```

```
<origin xyz="0 0 0.5" rpy="0 0 0"/>
```

```
<geometry>
```

```
<box size="0.2 0.2 1"/>
```

```
</geometry>
```

```
</visual>
```

```
<inertial>
```

→ 1 kg

```
<origin xyz="0 0 0.5" rpy="0 0 0"/>
```

```
<mass value="1"/>
```

```
<inertia
```

```
  ixx="1.0" ixy="0.0" ixz="0.0"
```

```
  iyy="1.0" iyz="0.0" izz="1.0"/>
```

```
</inertial>
```

```
</link>
```

```
<!-- Moveable Link -->
```

```
<link name="link2">
```

```
<visual>
```

```
<origin xyz="0 0 0.5" rpy="0 0 0"/>
```

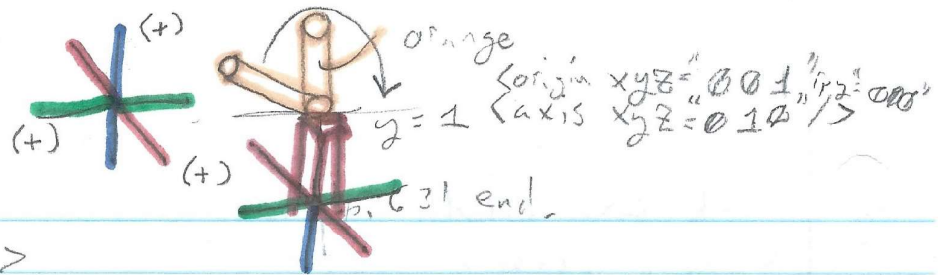
```
<geometry>
```

```
<cylinder length="1" radius="0.1"/>
```

```
</geometry>
```

```
</visual>
```

Rviz



link2

<inertial>

<origin xyz="0 0 0.5" rpy="0 0 0" />

<mass value="1" />

<inertia

ixx="0.1" ixy="0.0" ixz="0.0"

iyy="0.1" iyz="0.0" izz="0.005" />

</inertia>

</link>

<joint name="joint1" type="continuous">

<parent link="link1" />

<child link="link2" />

<origin xyz="0 0 1" rpy="0 0 0" />

<axis xyz="0 1 0" />

</joint>

meters

4 inches

<robot>

line 36: <cylinder length="1" radius="0.1" />

• As a cylinder of length 1 m and radius 0.1 m.

• The inertial properties for link2:

■ mass = 1 kg,  $ixx = iyy = 0.1$  and  $izz = 0.005$

• The density mass  $m$  and length  $l$ , the rotational inertia about X or Y axis is  $I_{xx} = I_{yy} = (1/12) m l^2 \Rightarrow .083$

• The assigned values have been rounded up to 0.1 m 2 kg.

p. 180

$$.1 = x .005$$

$$.005$$

$$.1/20 = .005 \quad x = 20$$



p. 159 Convert continuous joint to revolute.

- Revolute - a hinge joint that rotates along the axis and has a limited range specified by the upper and lower limits.

<!-- Modify joint1 -->

<joint name="joint1" type="revolute">

<parent link="link1"/>

<child link="link2"/>

<origin xyz="0 0 1" rpy="0 0 0"/>

<axis xyz="0 0 1"/>

<limit effort="10.0" lower="0.0" upper="2.0"

velocity="0.5"/>

<dynamic damping="1.0"/>

</joint>

- Upper and lower joint limits constrained to the range 0 to 2.0

- Express actuator dynamic limits:

- Velocity limit (here set to 0.5 rad/s)

- torque limit (10.0 Nm)

■ Nm = Newton metre

■ torque - represents energy transferred or expended per-angle of revolution. Equivalent to 1 joule per-radian.