XACRO Basics

Estimated time to completion: **4 minutes**

7.3 Manually Generating URDF Files from XACRO Files

You already know that **XACRO** is the name of the language you use to write **.xacro** files. Now, **XACRO** also happens to be the name of the utility program that automatically generates the **URDF** file necessary to render a robot model. You use it like this:

In [ ]:
```
xacro [in.xacro] > [out.urdf]
```

The current values should replace the fields `[in.xacro]` and `[out.urdf]` .

Converting XACRO files into URDF files involves expanding the macros in the XACRO file (explained later) and generating a single URDF file containing all the necessary robot descriptions. This URDF file can then be loaded into a robot simulator such as Gazebo or visualization tools such as RVIZ.

- Exercise 7.2.1 -

Convert the **.xacro** file you created in the previous exercise to an **.urdf** file called **converted_box_bot_file.urdf**.

▶ Execute in Webshell 1

In [ ]:
```
cd ~/ros2_ws/src/my_box_bot_description/urdf
```

Now, run the utility program **XACRO** to generate a URDF file:

In [ ]:
```
xacro box_bot.xacro > converted_box_bot_file.urdf
```

If you do an `ls` of the directory, you will find a new file created:

In [ ]:
```
ls
```

```
box_bot.xacro  box_bot_simple.urdf  converted_box_bot_file.urdf
```

Check the contents of the **converted_box_bot_file.urdf** file:

▶ **Execute in Webshell 1**

In [ ]:
```
cat converted_box_bot_file.urdf
```

Expected output

```
<?xml version="1.0" ?>
<!-- =================================================================================== -->
<!-- |    This document was autogenerated by xacro from box_bot.xacro                  | -->
<!-- |    EDITING THIS FILE BY HAND IS NOT RECOMMENDED                                  | -->
<!-- =================================================================================== -->
<robot name="my_box_bot">
  <!-- Body -->
  <link name="chassis">
    <visual>
      <geometry>
        <box size="0.1 0.1 0.1"/>
      </geometry>
    </visual>
    <collision>
      <geometry>
        <box size="0.1 0.1 0.1"/>
      </geometry>
    </collision>
    <inertial>
      <mass value="0.5"/>
      <origin rpy="0 0 0" xyz="0 0 0"/>
      <inertia ixx="0.0008333333333333335" ixy="0" ixz="0" iyy="0.0008333333333333335" iyz="0" izz="0.0008333333333333335"/>
    </inertial>
  </link>
</robot>
```

This is the URDF file of the XACRO robot model.

- End of Exercise 7.2.1 -

16/11/2023