

5.2.1

## TF Reference Frames: How and Where?

# How are reference frames created?

- ROS Package: Robot state publisher (robot\_state\_publisher)
  - joint state information - /joint\_states topic
  - robot\_description parameter - URDF/XACRO (hrwros.xacro)
- Fixed frame of reference: "world"

hrwros\_gazebo/launch/hrwros\_environment.launch

```
<!-- Combine joint state information from two robots. -->  
<node name="joint_state_publisher"  
  pkg="joint_state_publisher" type="joint_state_publisher">  
  <rosparam="/source_list">[/robot1/joint_states,  
    /robot2/joint_states]</rosparam>  
</node>
```

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## Note!

**In your files, the joint states of the two  
robot arms are in a different topic:**

*combined\_joint\_states*

**The joint states of the Turtlebot remain in the  
*joint\_states* topic**

# How are reference frames created?

```
donnie@tudelft: ~/ros/hrwros_ws
/home/donnie/ros/hrwros_code_ws/src/hrwros_code/hrwros_gazebo/launch/hrwros_environment.launch h
donnie@tudelft: ~/ros/hrwros_ws$ rostopic info /joint_states
Type: sensor_msgs/JointState

Publishers:
* /joint state publisher (http://tudelft:37659/)
* /gazebo (http://tudelft:41579/)

Subscribers:
* /robots state publisher (http://tudelft:44909/)
* /move_group (http://tudelft:43909/)
```

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hrwros\_gazebo/launch/hrwros\_environment.launch

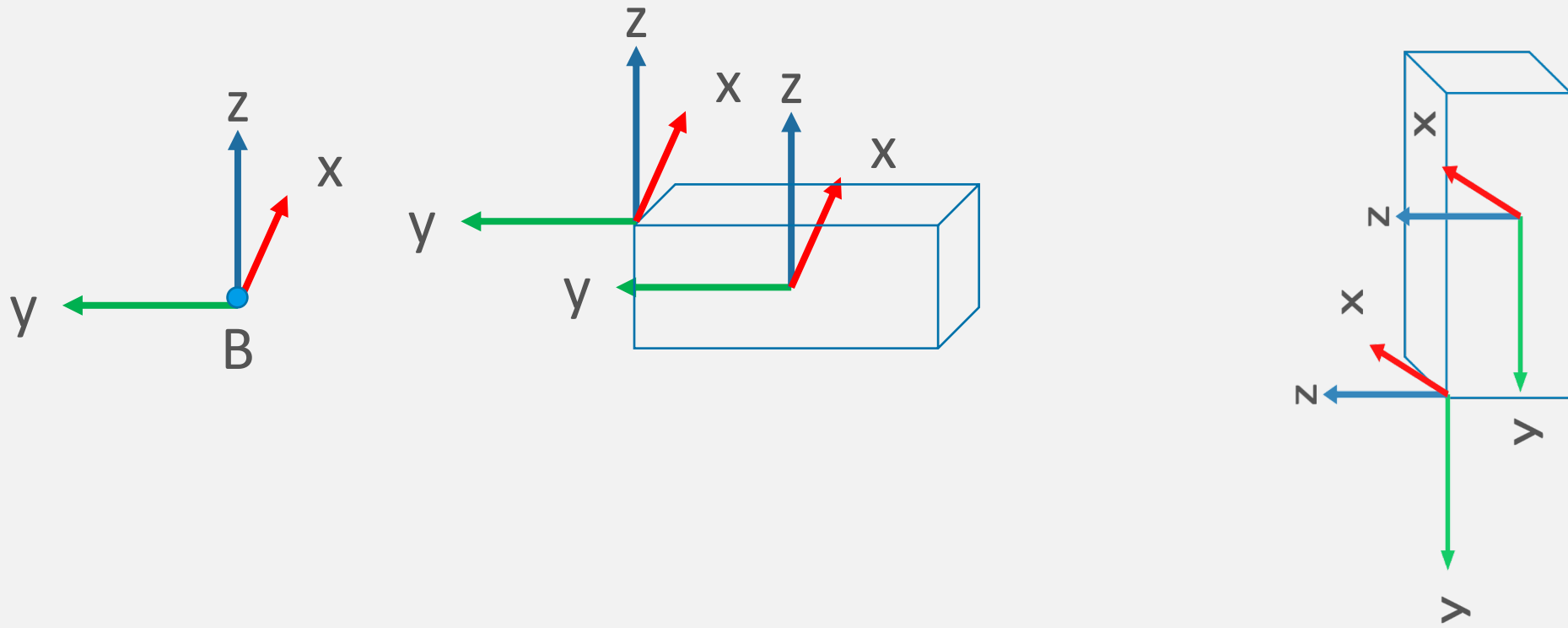
```
<!-- Load the URDF on to the ROS parameter server. -->  
<include file="$(find  
hrwros_support)/launch/load_hrwros.launch"/>
```

hrwros\_support/launch/load\_hrwros.launch

```
<launch>  
<param name="robot_description" command="$(find  
xacro)/xacro --inorder '$(find  
hrwros_support/urdf/hrwros.xacro)' "/>  
</launch>
```

# Where are reference frames located?

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# Reference frames: Joints in xacro

hrwros\_support/urdf/hrwros.xacro

```
<!-- Reference frame for robot2_pedestal_joint -->  
<joint name="robot2_pedestal_joint" type="fixed">  
  <parent link="world"/>  
  <child link="robot2_pedestal_link"/>  
  <origin xyz="-7.8 -1.5 0"/>  
</joint>
```