

Arduinobot

Introduction

Setup

Digital
Twin

ROS 2

Control

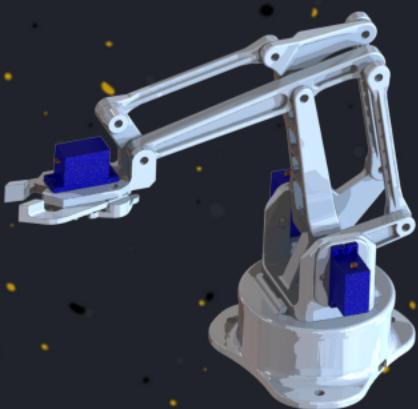
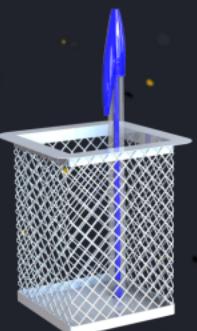
Kinematics

Application

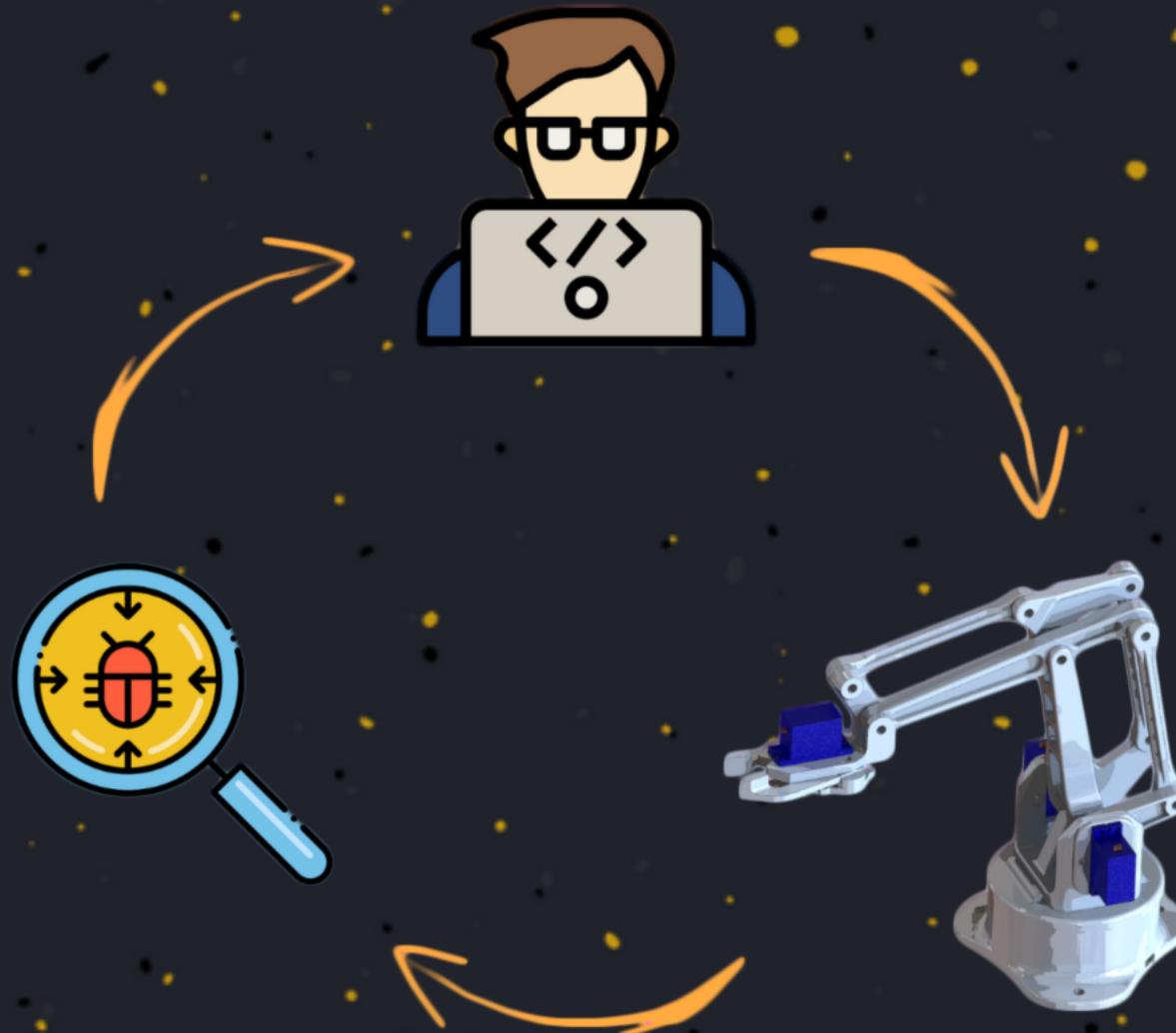
Alexa

Conclusions

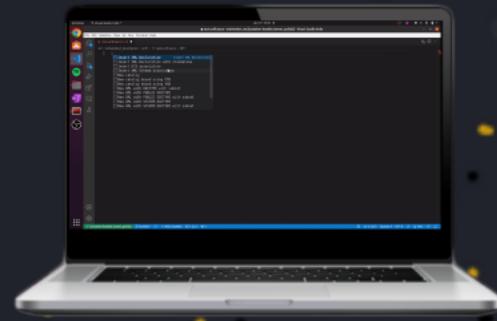
Build



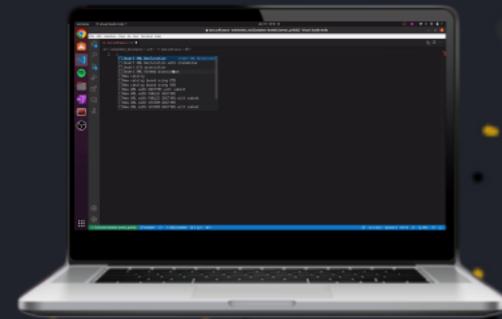




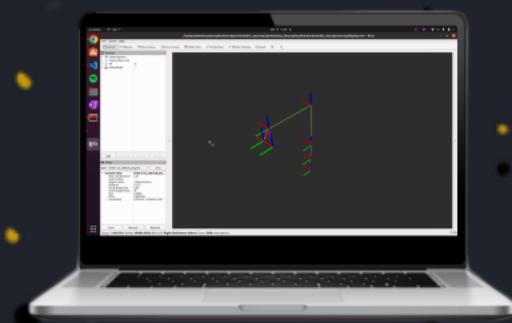




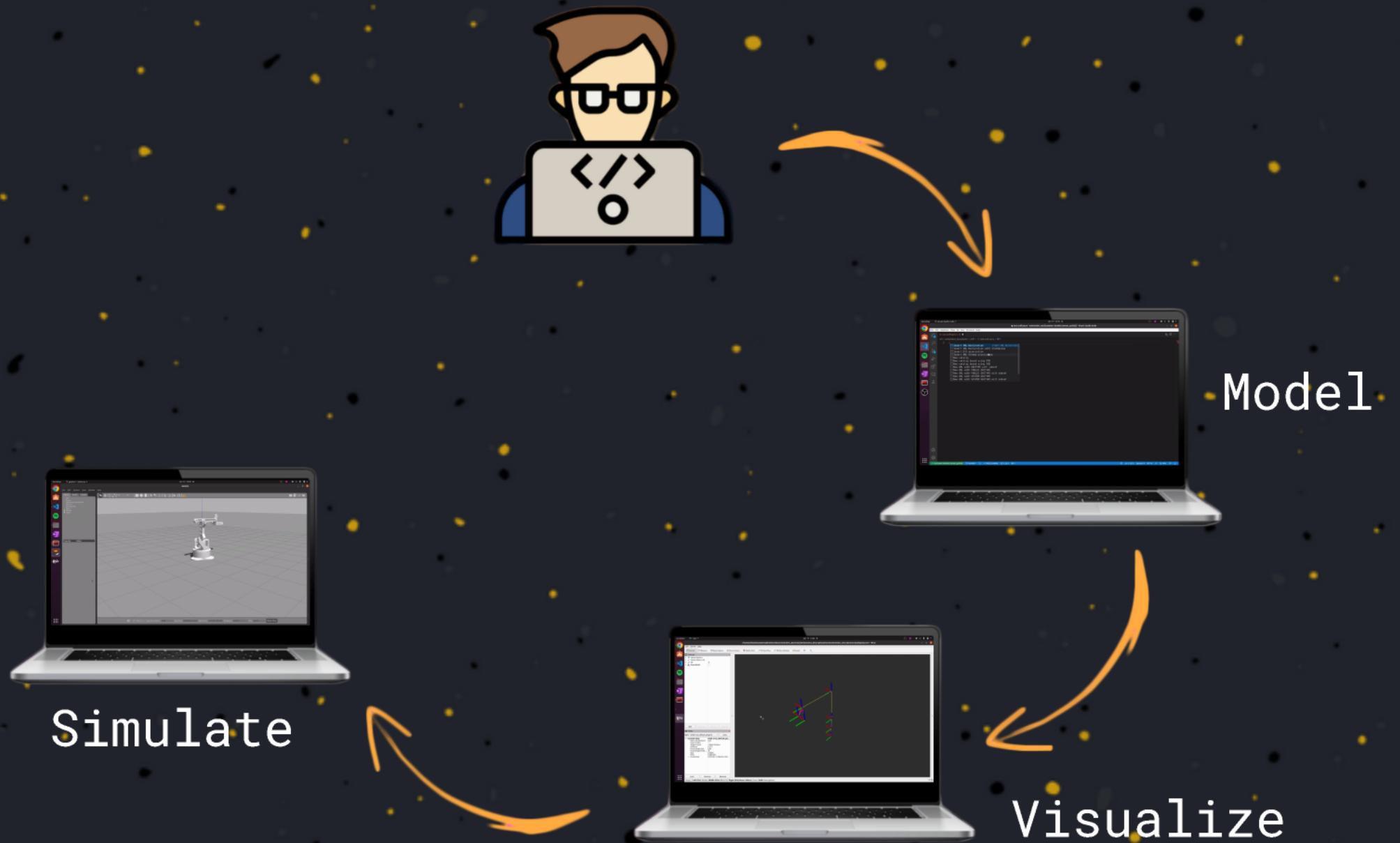
Model



Model



Visualize





Model

Simulate

Visualize

URDF - Unified Robot Description Format



URDF - Unified Robot Description Format



```
<robot>  
...  
</robot>
```

URDF - Unified Robot Description Format



URDF - Unified Robot Description Format



<robot>

</robot>

URDF - Unified Robot Description Format



```
<robot>
  <link>
    ...
  </link>
</robot>
```

<link>

...

</link>



```
<link>
```

```
...</link>
```

```
<name>
```



```
<link>
```

```
  . . .
```

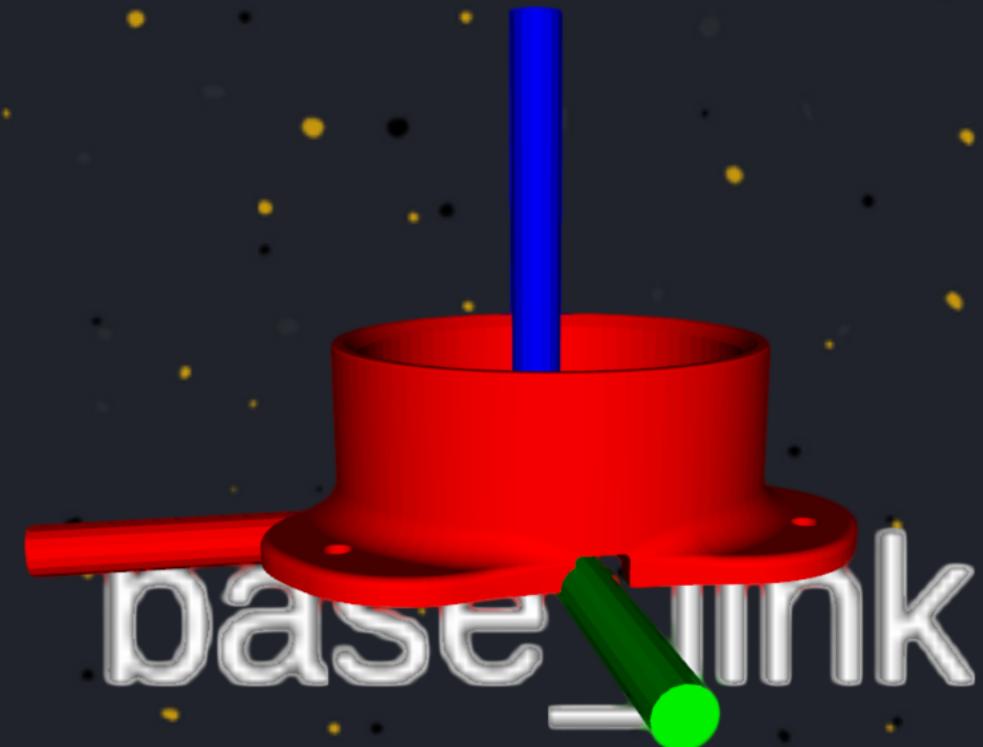
```
</link>
```

```
    <name>
```

```
      <visual>
```

```
        <collision>
```

```
          <inertial>
```



URDF - Unified Robot Description Format



```
<robot>
  <link>
    ...
  </link>
</robot>
```

URDF - Unified Robot Description Format



```
<robot>
  <link>
    ...
  </link>
  <joint>
    ...
  </joint>
</robot>
```

```
<joint>
```

```
</joint>
```



```
<joint>
```

```
  ...
```

```
</joint>
```

```
    <parent>
```

```
      <child>
```



```
<joint>
```

```
</joint>
```

```
    <parent>
```

```
        <child>
```

```
<joint>
```

```
</joint>
```

```
<parent>
```

```
<child>
```



```
<joint>
```

```
  . . .
```

```
</joint>
```

```
<type>
```

```
<parent>
```

```
<child>
```

```
<origin>
```

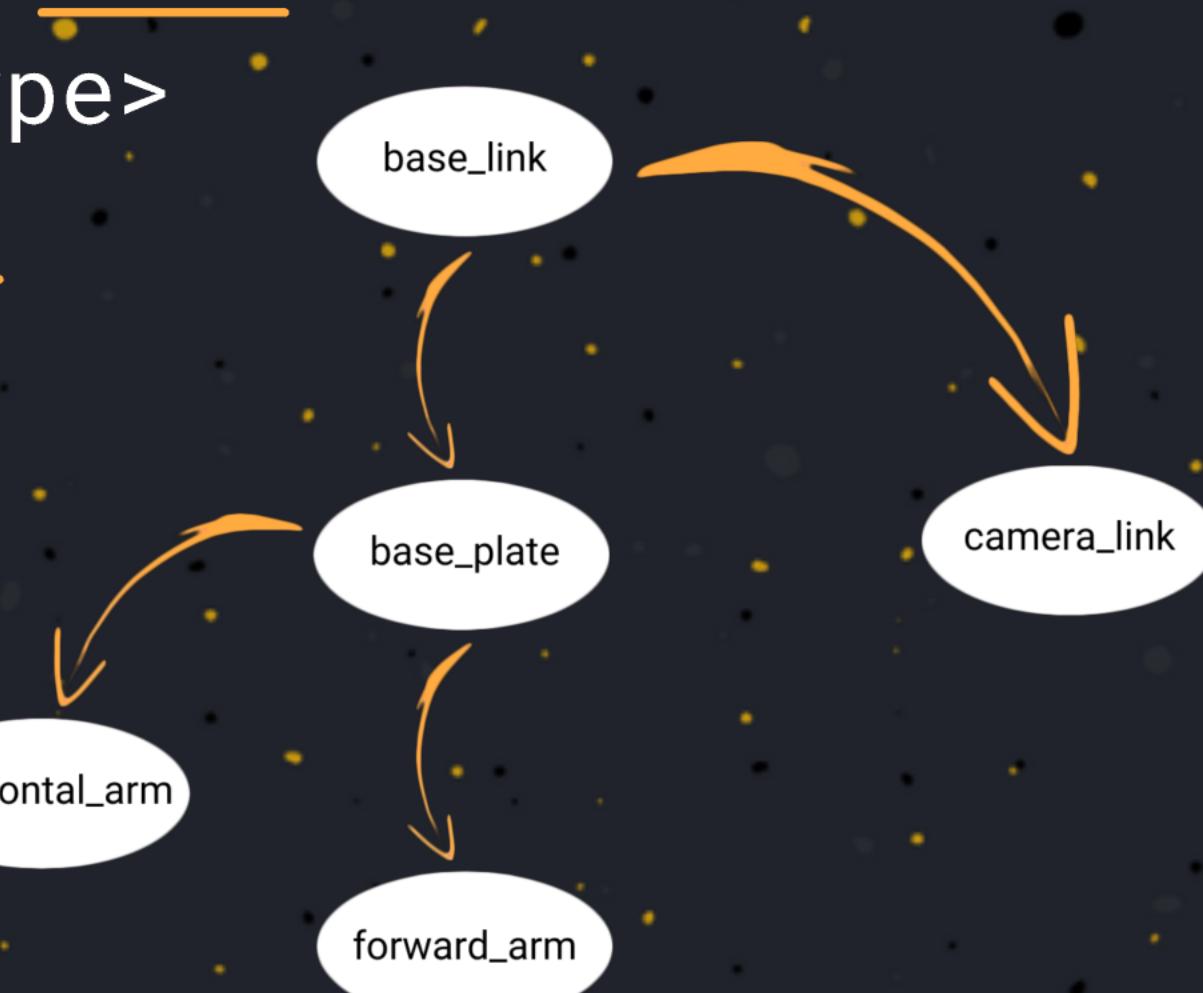
base_link

base_plate

horizontal_arm

forward_arm

camera_link



```
<joint>
```

```
  . . .
```

```
</joint>
```

```
  <type>
```

base_link

```
  <parent>
```

base_plate

```
  <child>
```

horizontal_arm

```
  <origin>
```

forward_arm

```
  <limit>
```

```
  <axis>
```

camera_link

URDF - Unified Robot Description Format



```
<robot>
  <link>
    ...
  </link>
  <joint>
    ...
  </joint>
</robot>
```

URDF - Unified Robot Description Format

```
<robot>
  <link>
    ...
  </link>
  <joint>
    ...
  </joint>
</robot>
```

URDF - Unified Robot Description Format



```
<robot>
  <link>
    ...
  </link>
  <joint>
    ...
  </joint>
</robot>
```

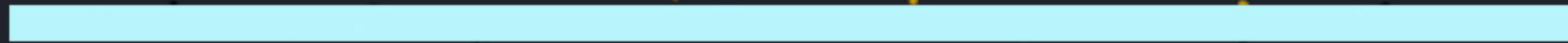


Model

Simulate

Visualize

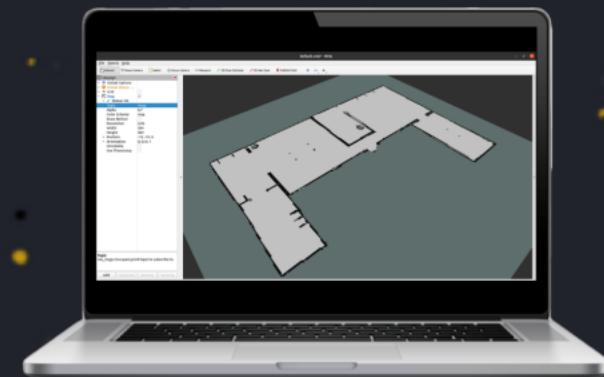
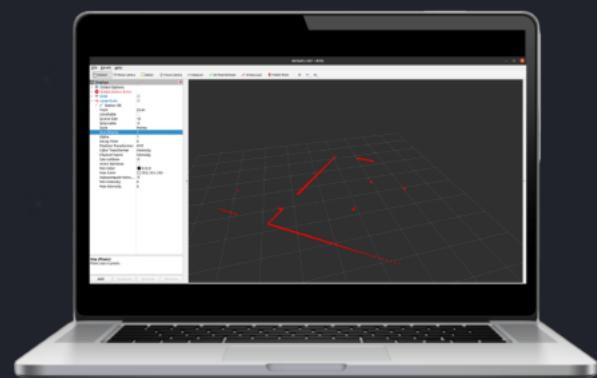
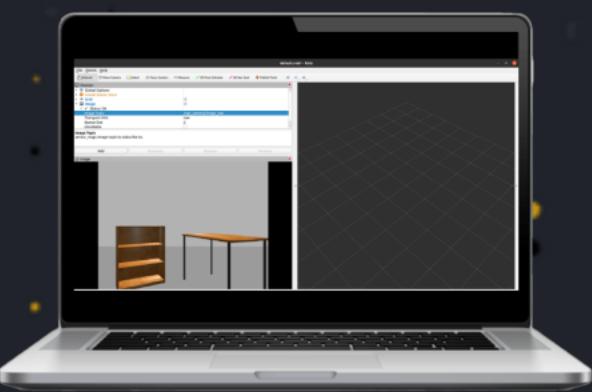
RViz 2 - ROS 2 Visualization

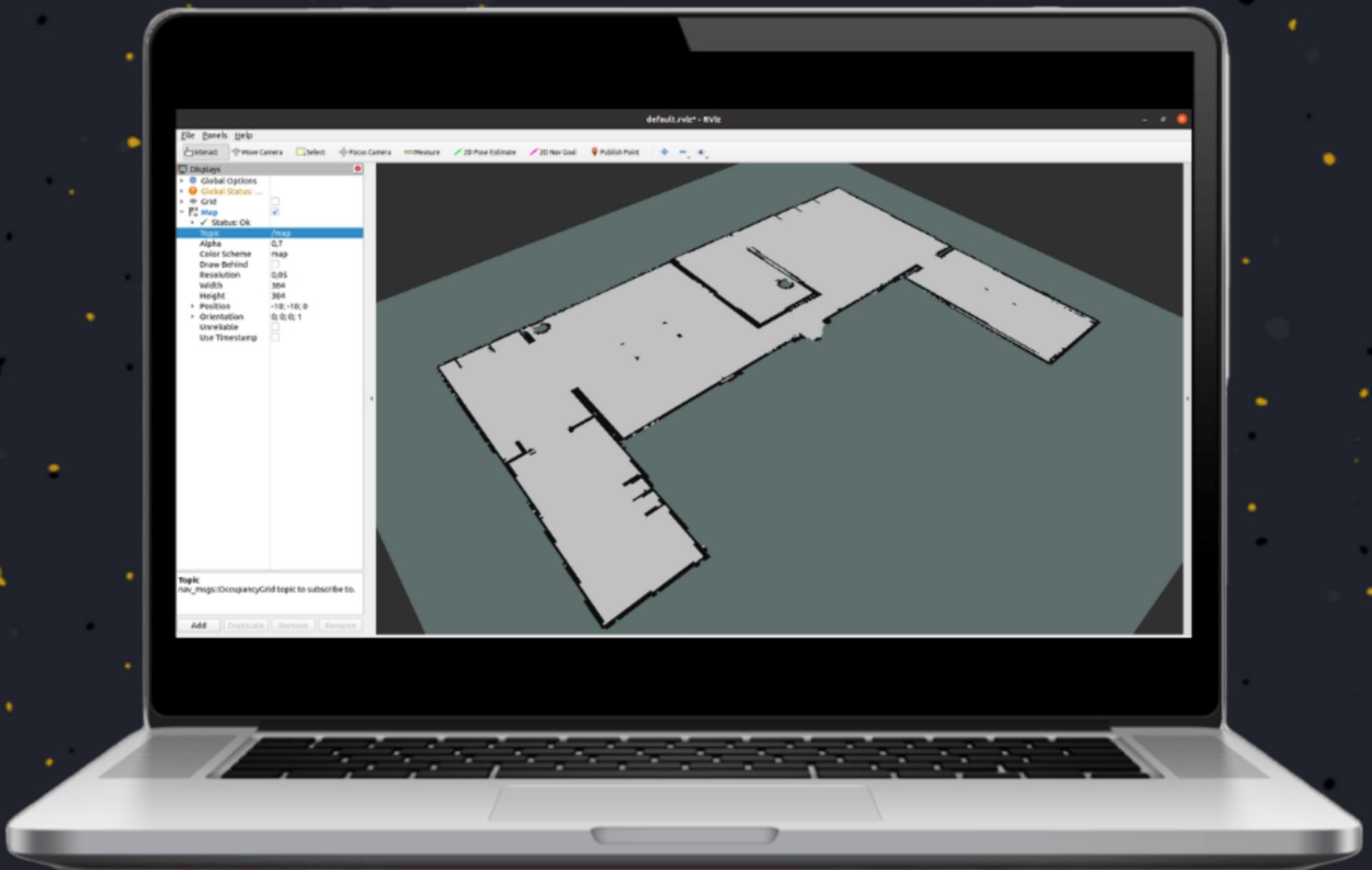


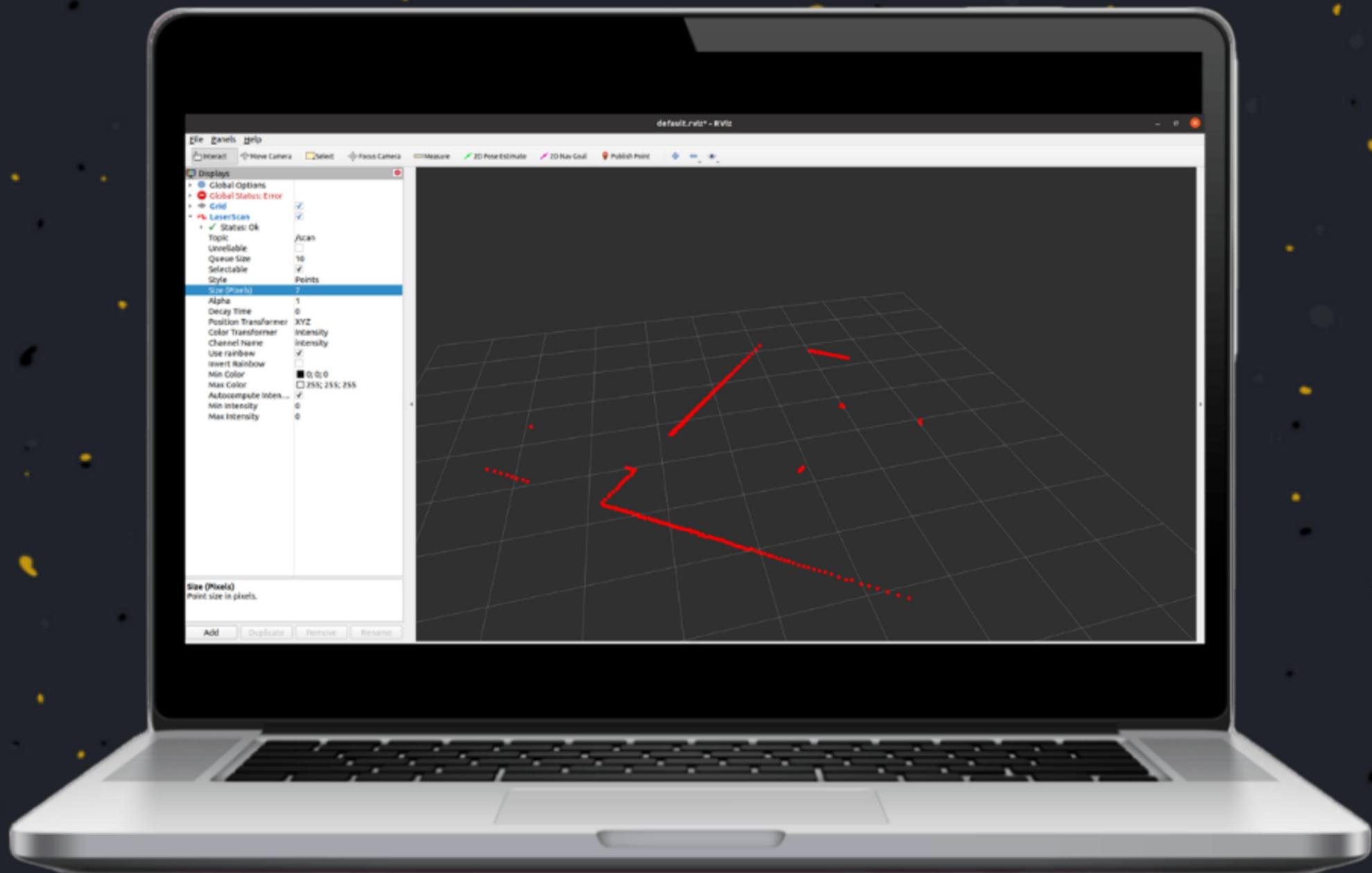
RViz 2 - ROS 2 Visualization

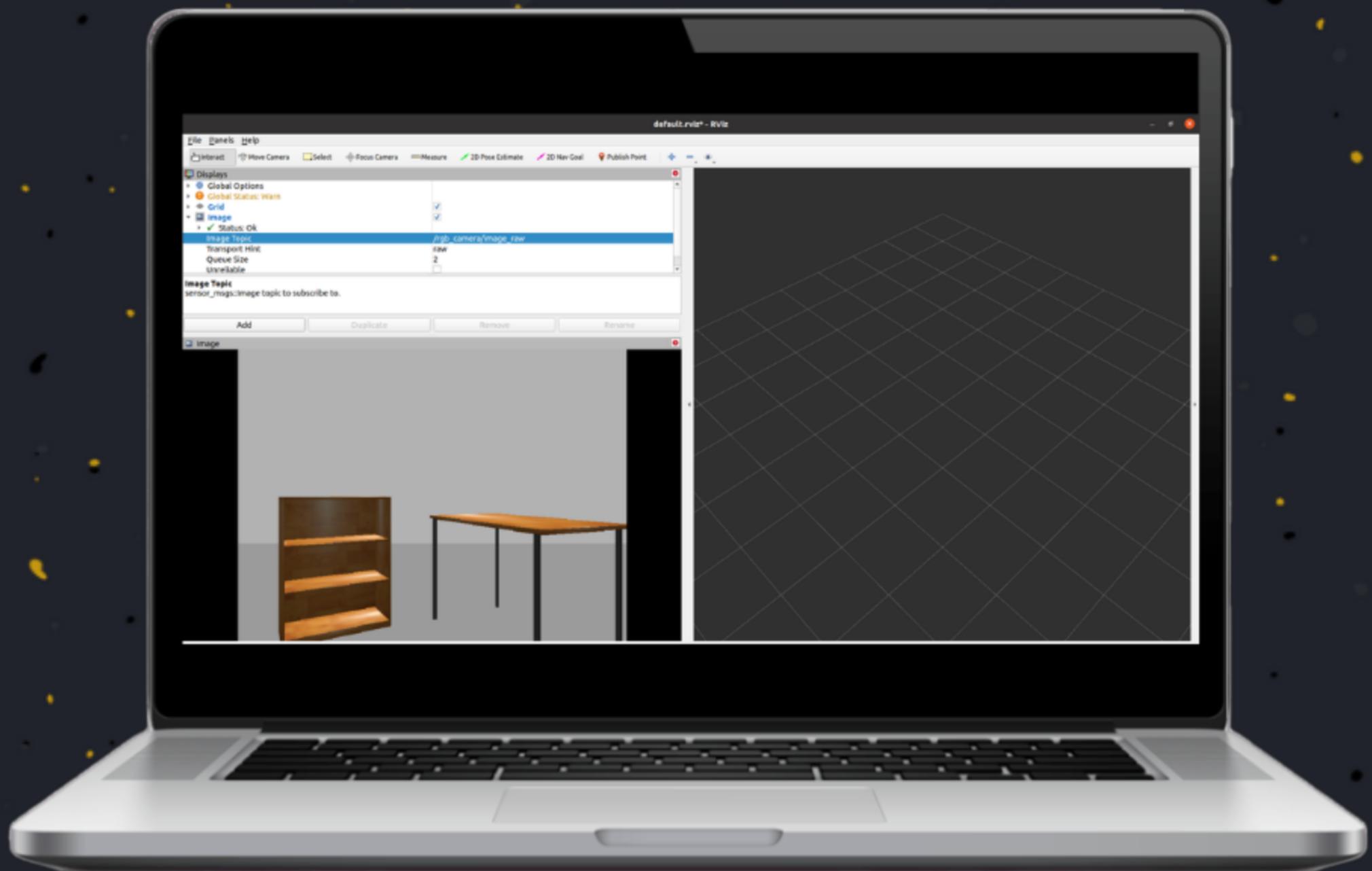


RViz 2 - ROS 2 Visualization

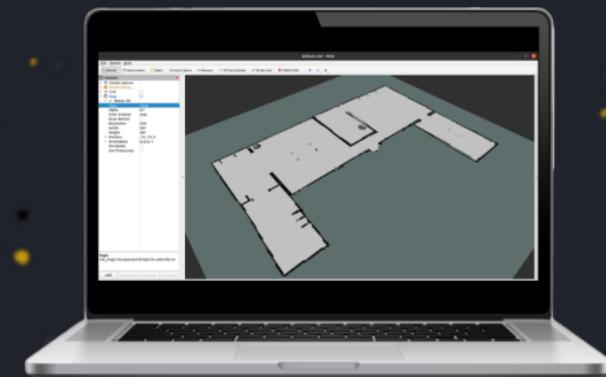
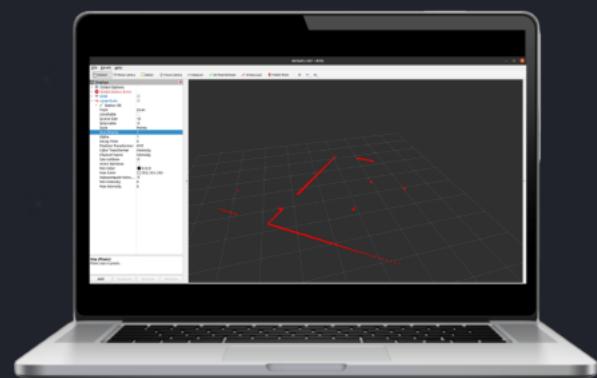
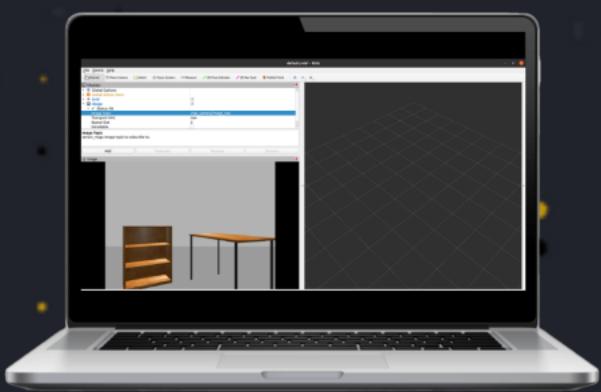








RViz 2 - ROS 2 Visualization





Model

Simulate

Visualize

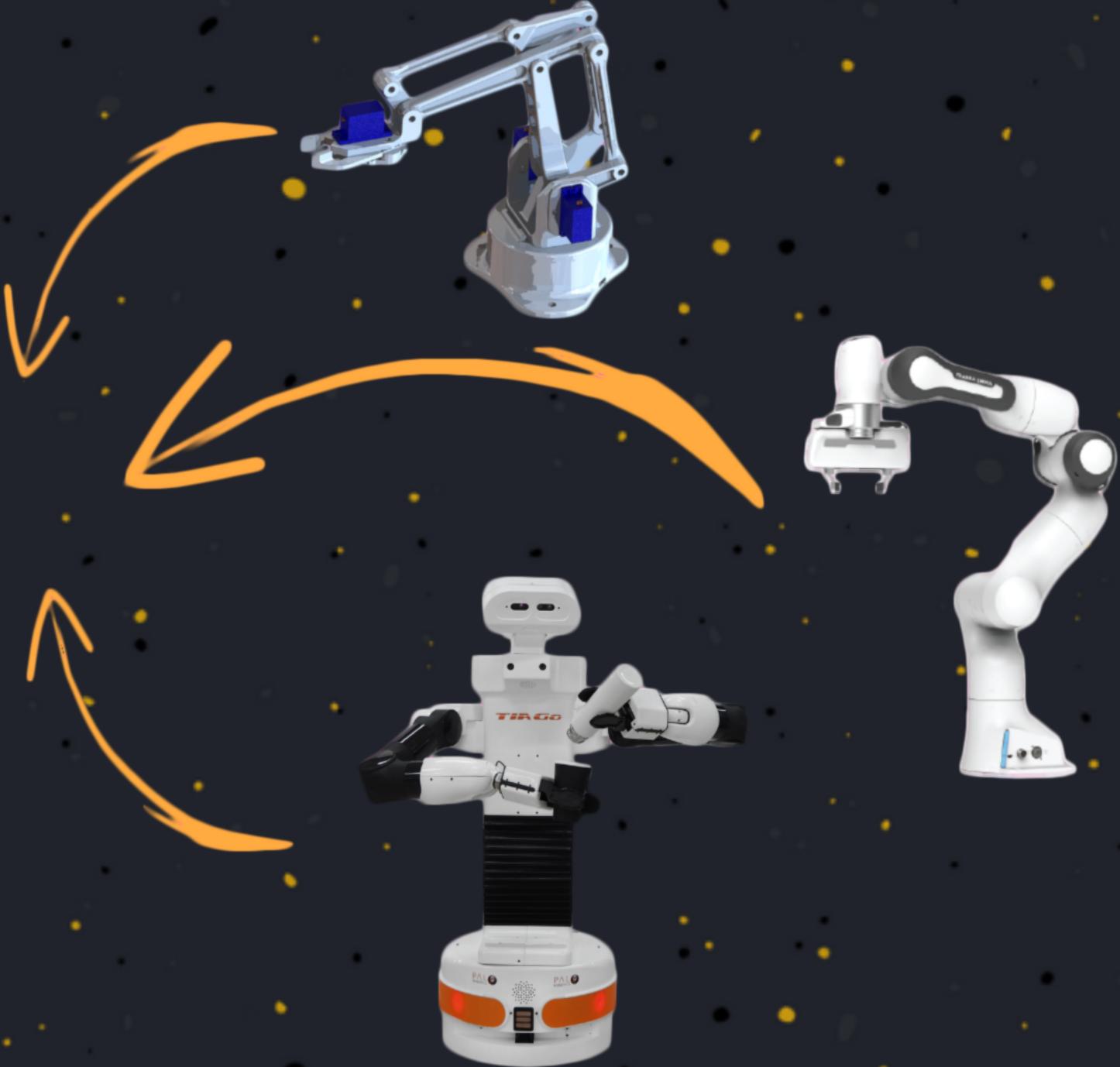
Parameters

> **MoveIt2**



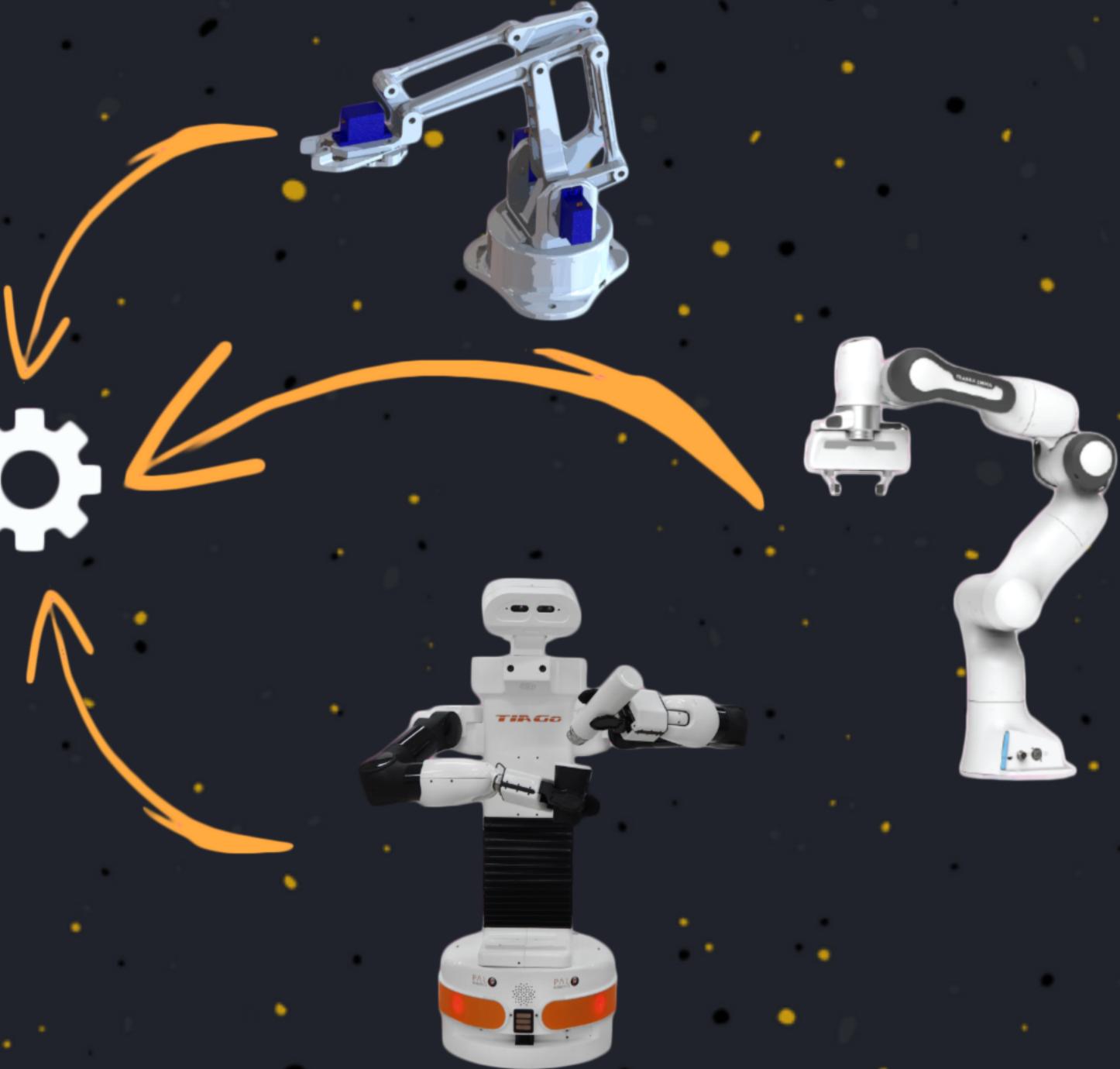
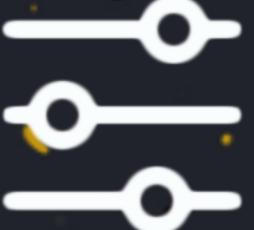
Parameters

> **MoveIt2**



Parameters

> **MoveIt2** 





Model

Simulate

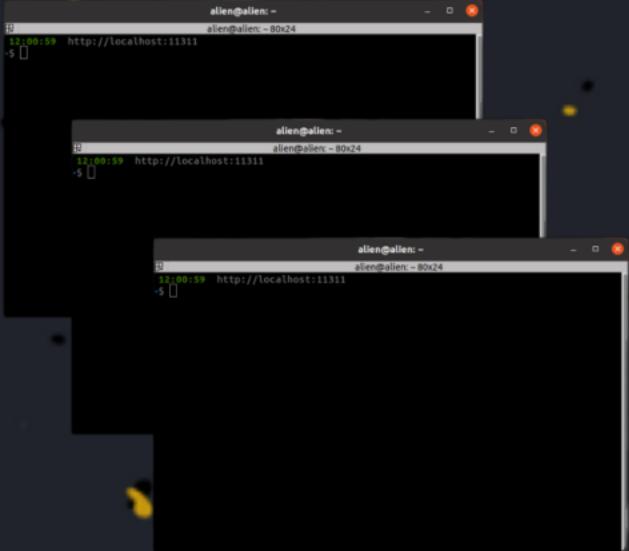
Visualize

Launch Files



ros2 node

Launch Files



ros2 node

ros2 node

Launch Files

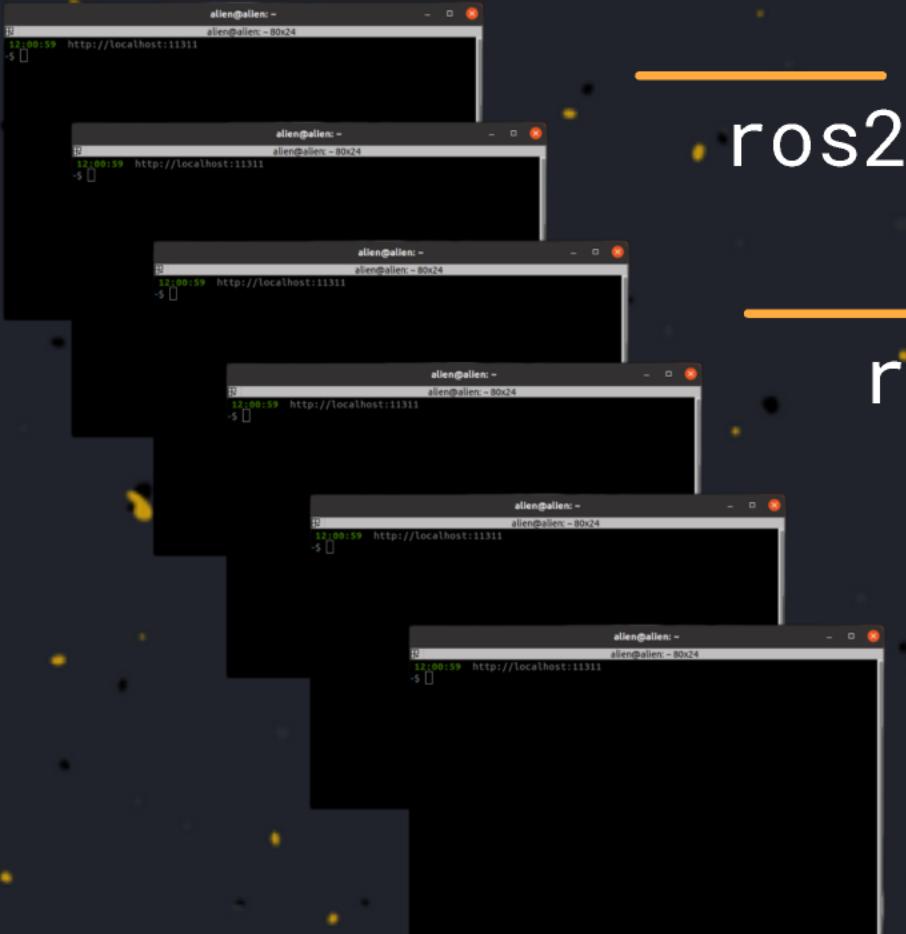


ros2 node

ros2 node

ros2 param

Launch Files



ros2 node

ros2 node

ros2 param



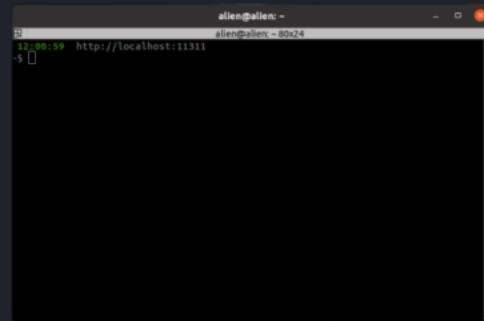
Launch

Launch



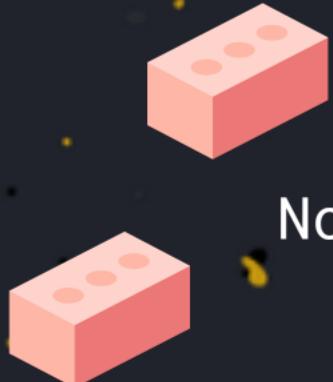
ros2 launch

Launch

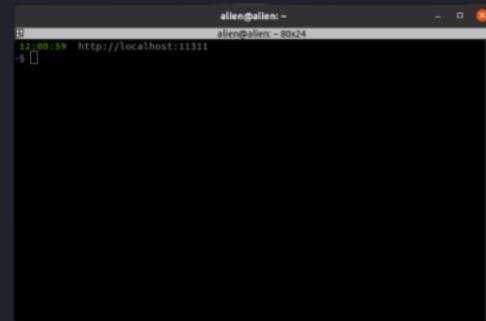


—
ros2 launch

Nodes



Launch



—
ros2 launch

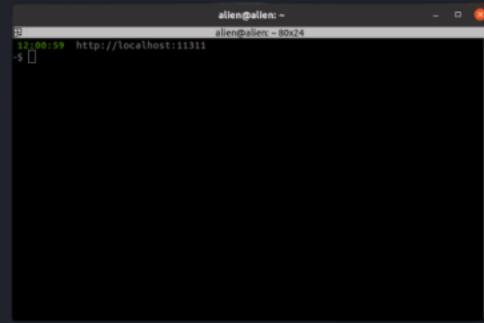


Nodes



Parameters

Launch



—
`ros2 launch`



Nodes

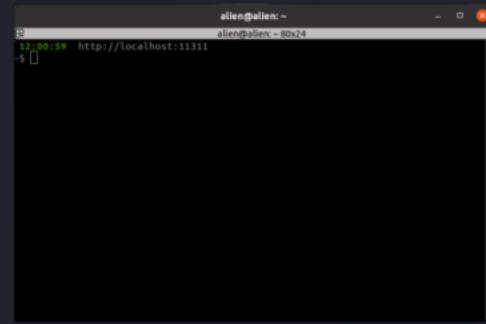


Parameters



Processes

Launch



ros2 launch



Nodes



Parameters



Processes



Launch
Files



Launch



ros2 launch



Nodes



Parameters



Processes



Launch
Files

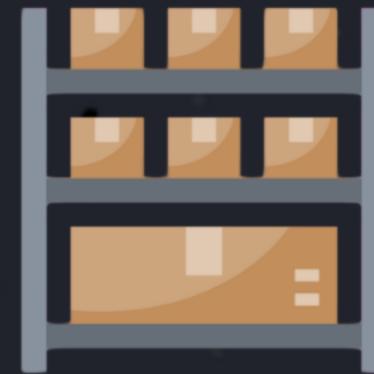


Launch Description

Launch Description



launch

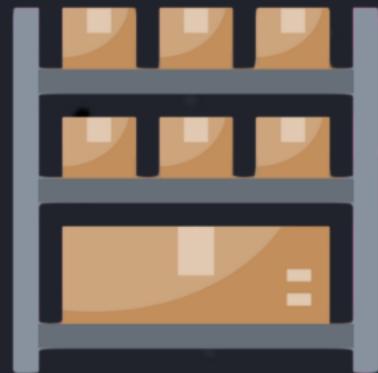


launch_ros

Launch Description



launch



launch_ros



actions



substitutions



event handlers

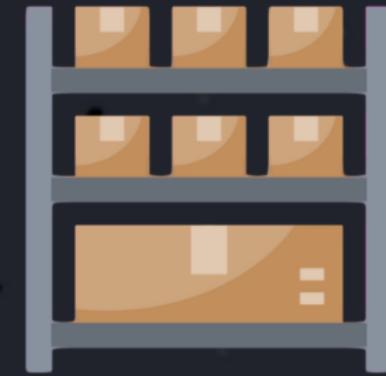


conditions

Launch Description



launch



launch_ros



actions



actions



substitutions



substitutions



event handlers



event handlers

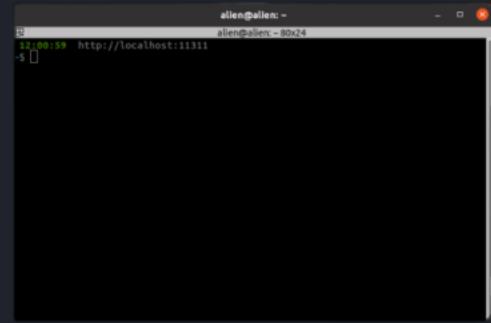


conditions



parameter_descriptions

Launch



ros2 launch



Nodes



Parameters



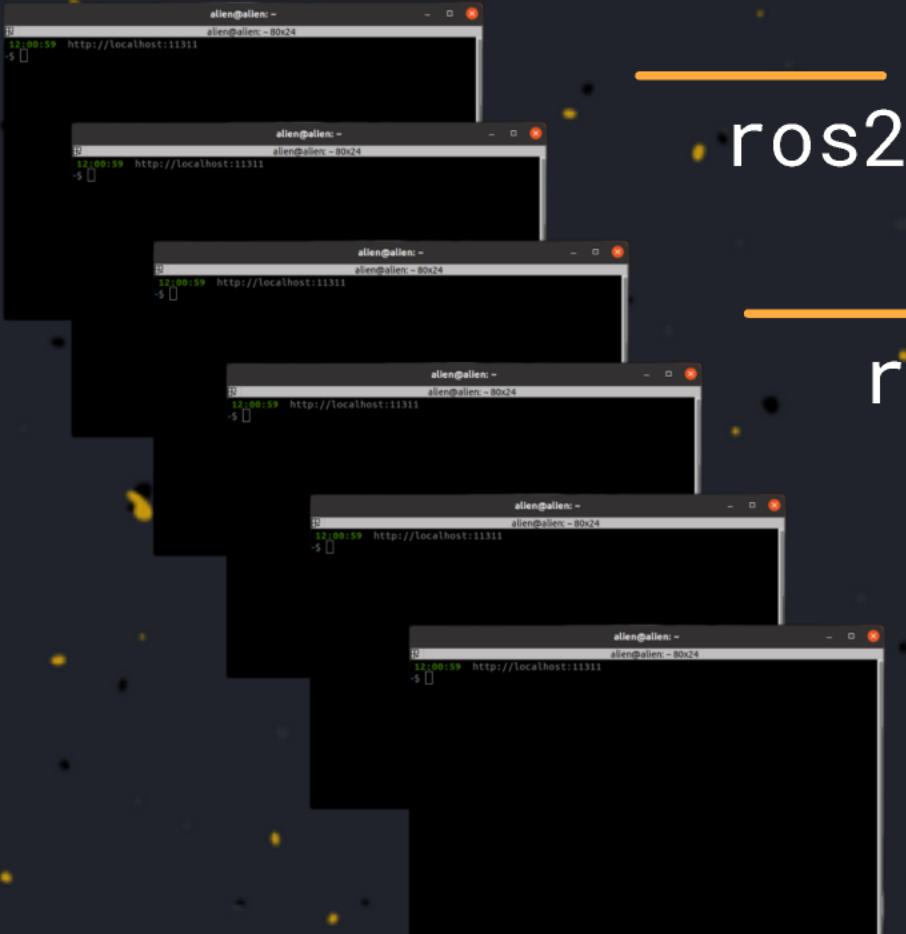
Processes



Launch
Files



Launch Files



ros2 node

ros2 node

ros2 param



Launch



Model

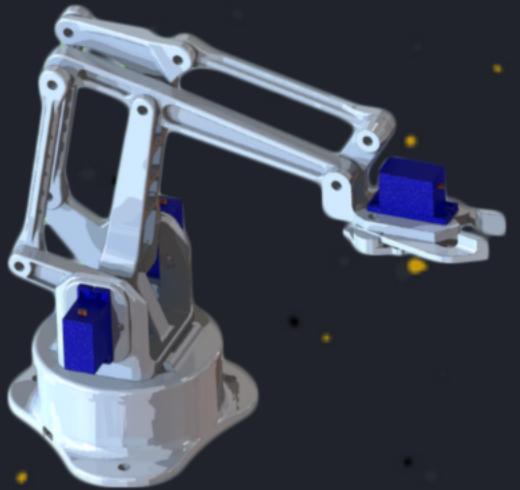
Simulate

Visualize



GAZEBO



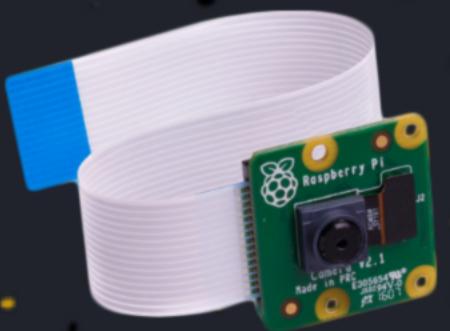




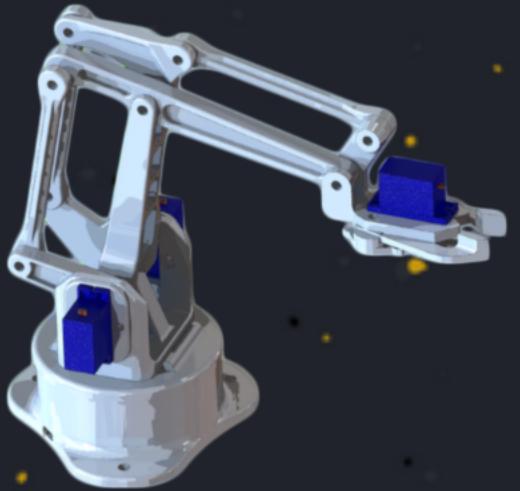
/joint_states



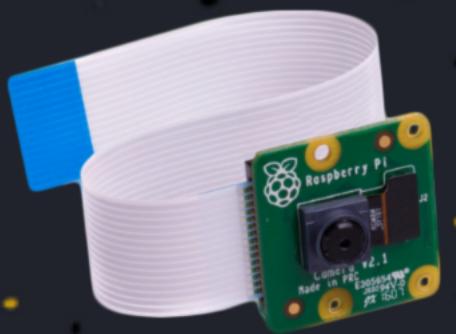
/joint_states



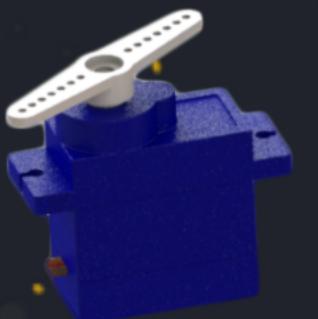
/camera



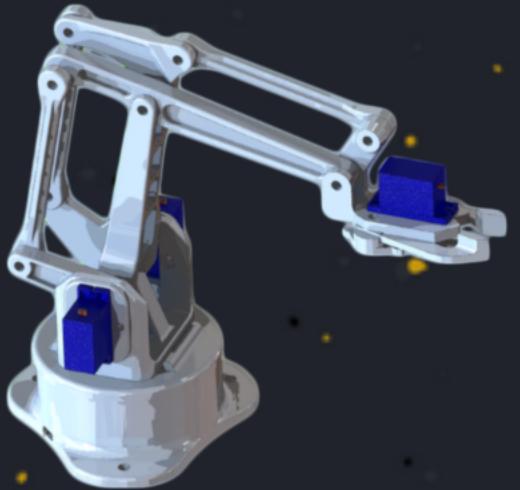
/joint_states



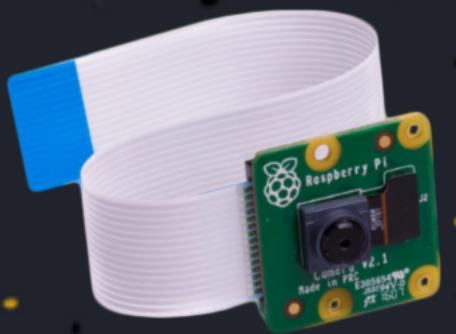
/camera



/motor



/joint_states



/camera



/motor





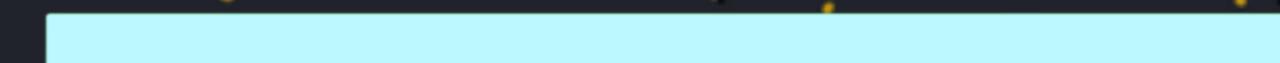
GAZEBO



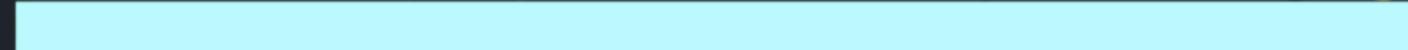
/joint_states



/camera

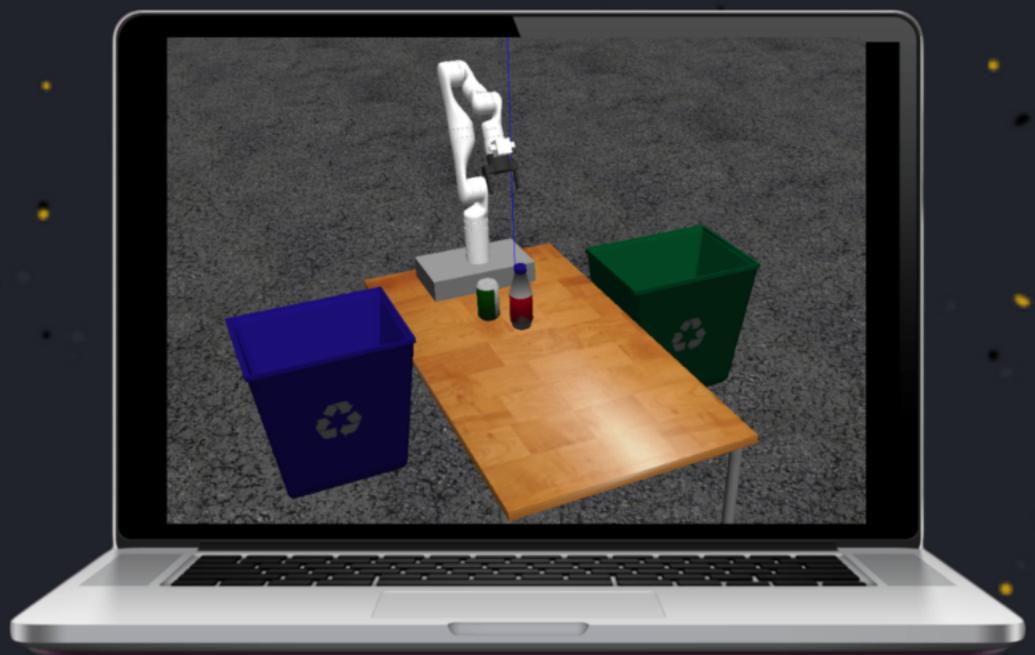


/motor





GAZEBO





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Conclusions

Build

