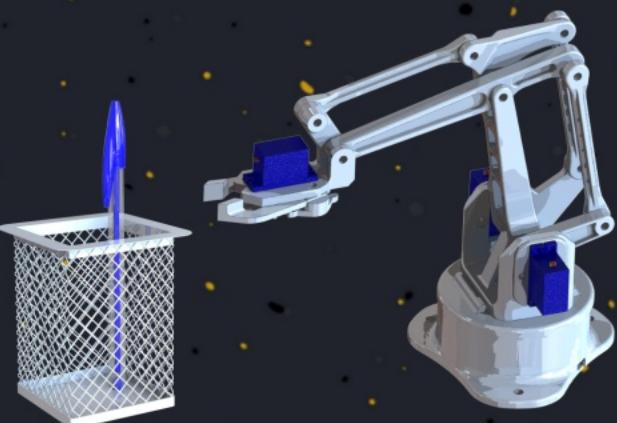
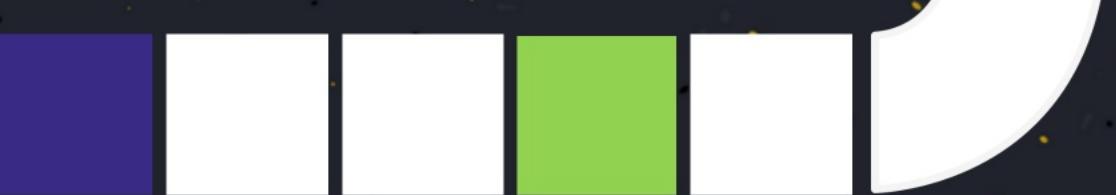
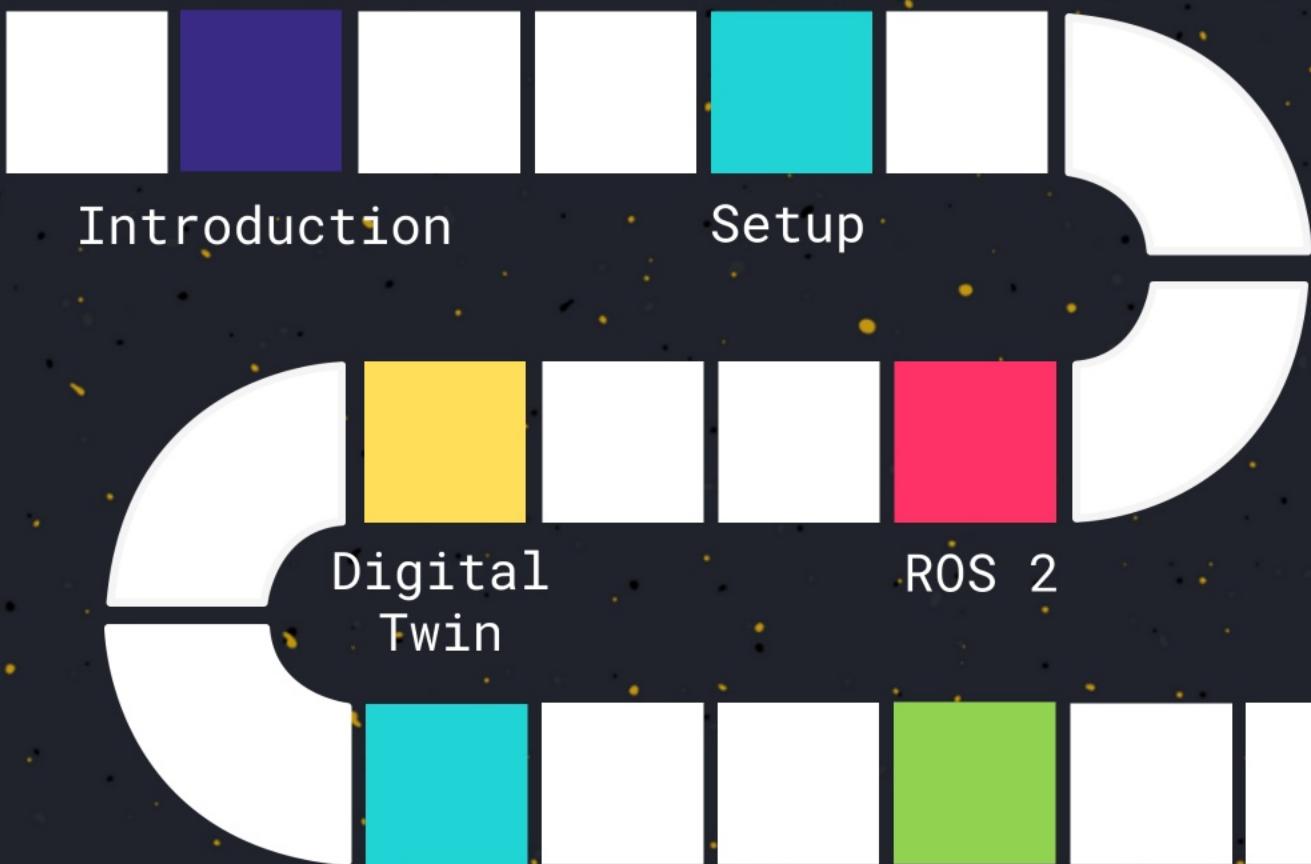
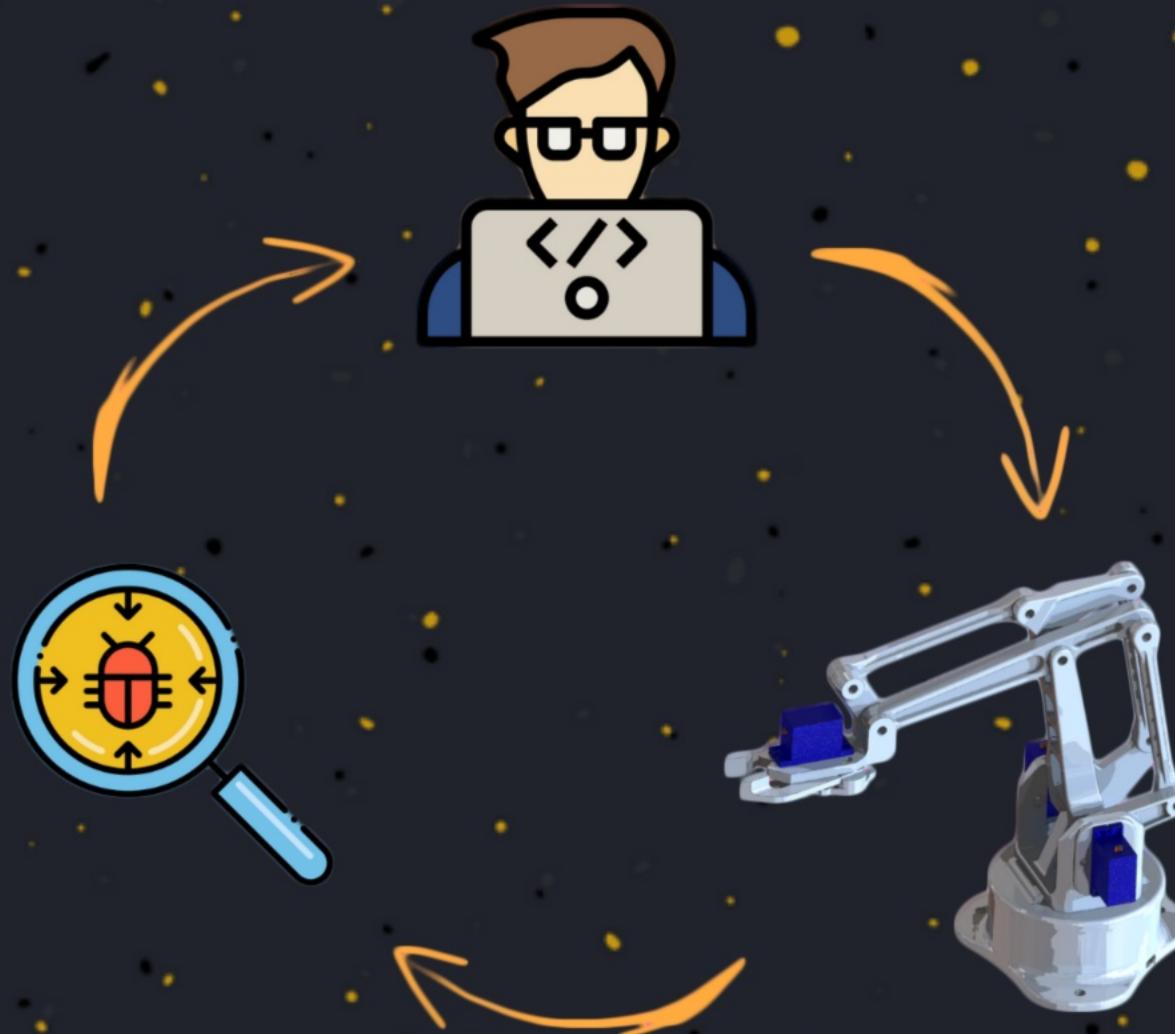


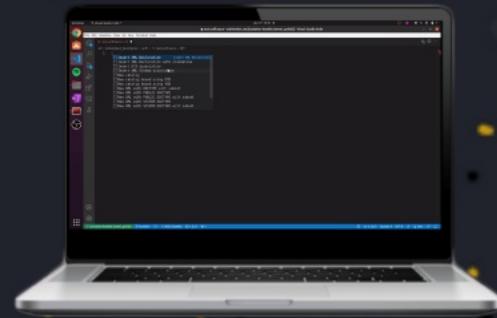
Arduinobot



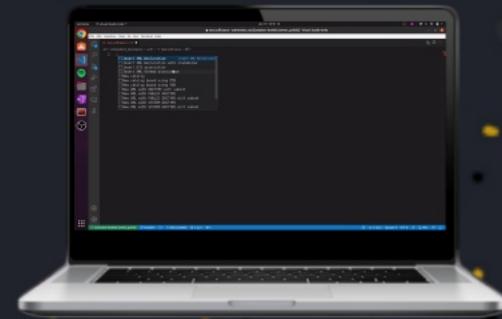




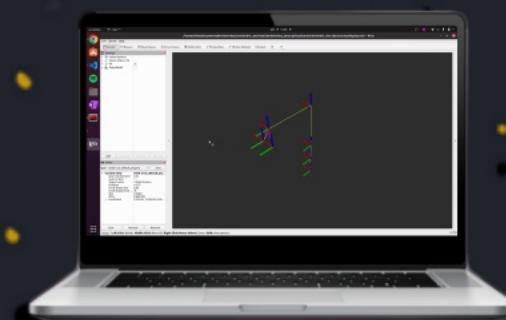




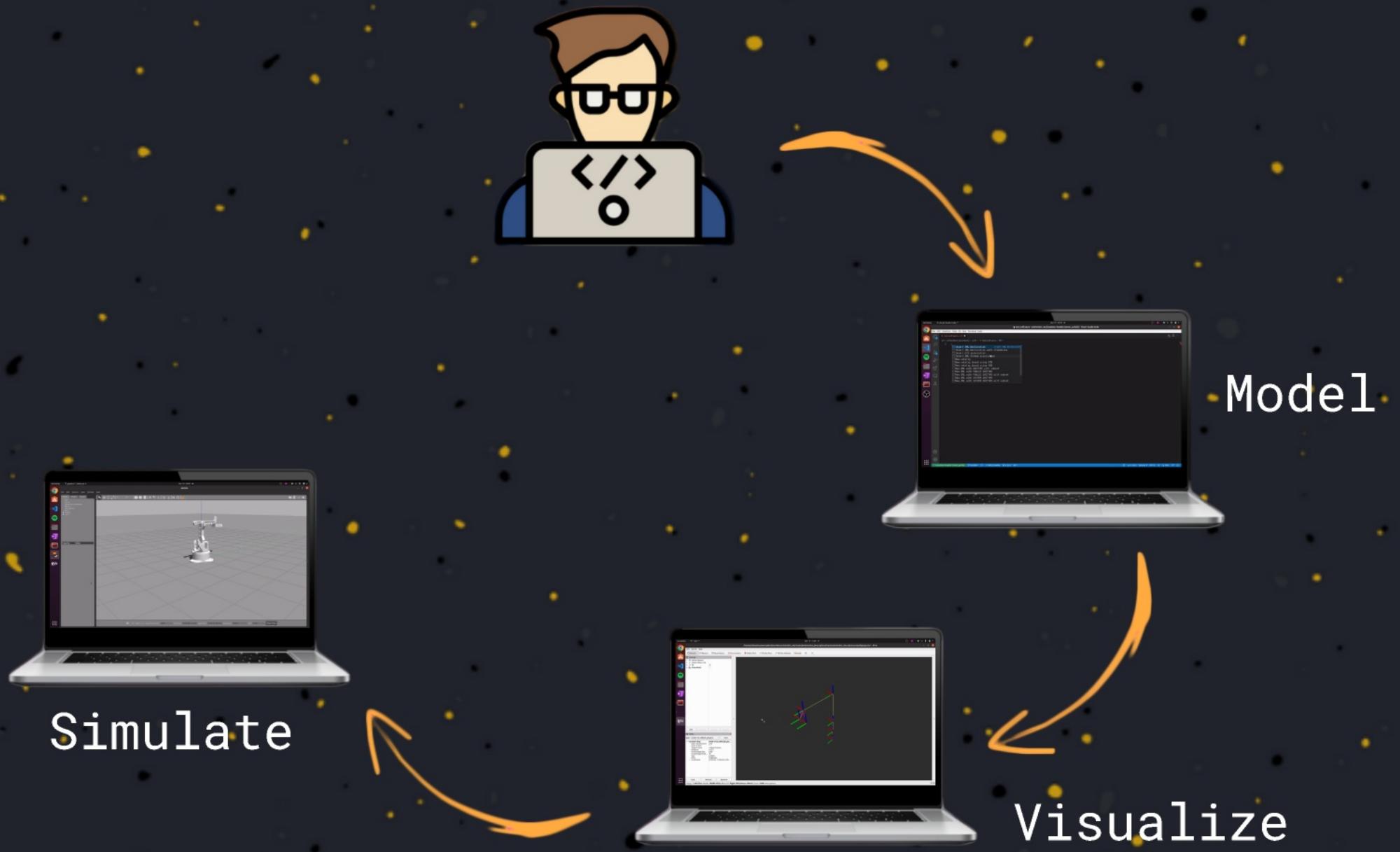
Model



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>



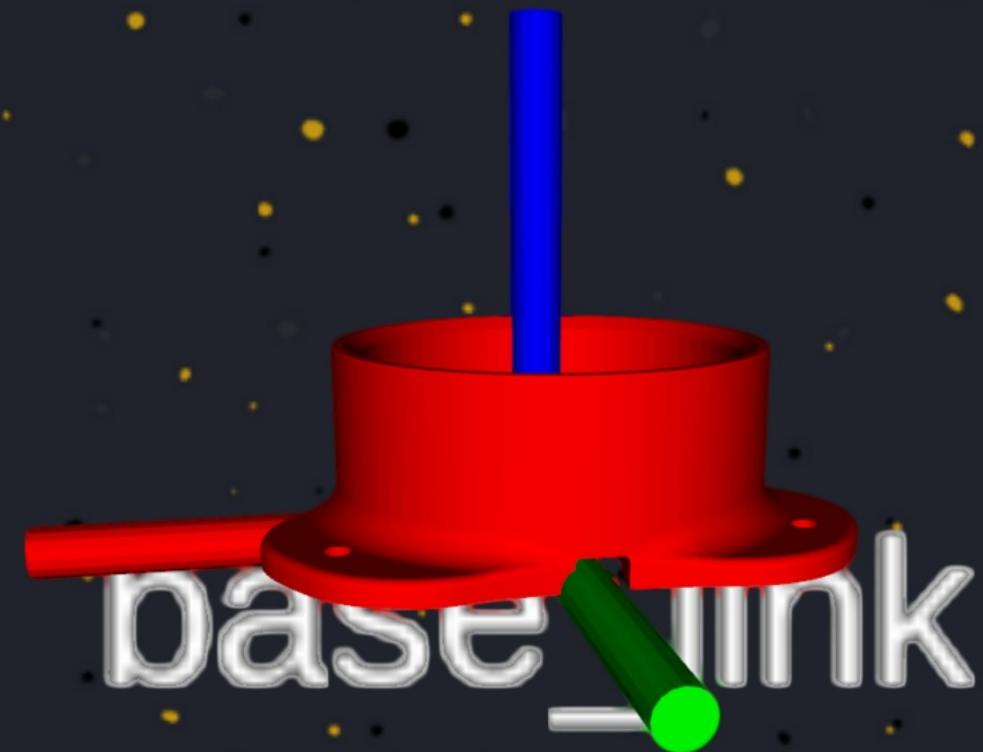
```
<link>
```

```
</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>
```

base_link

camera_link

base_plate

horizontal_arm

forward_arm



```
<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>
```

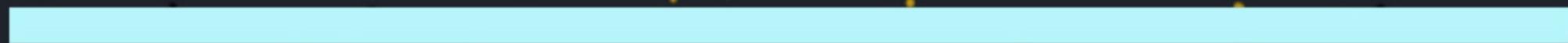


Model

Simulate

Visualize

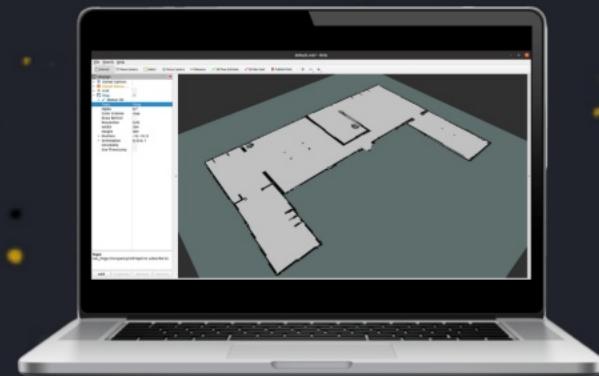
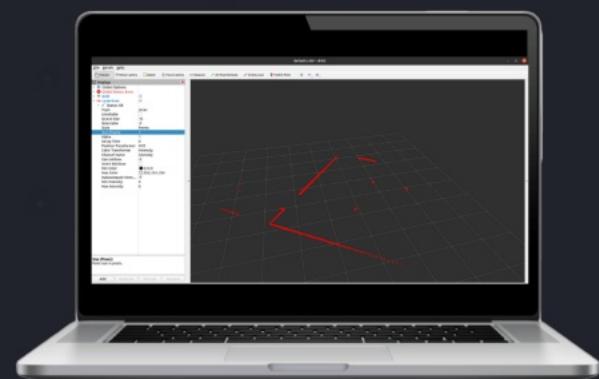
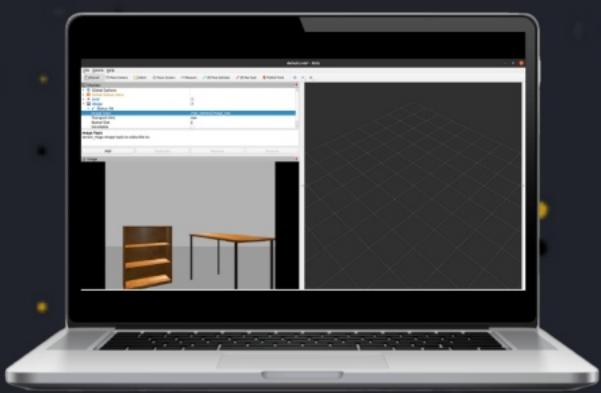
RViz 2 - ROS 2 Visualization

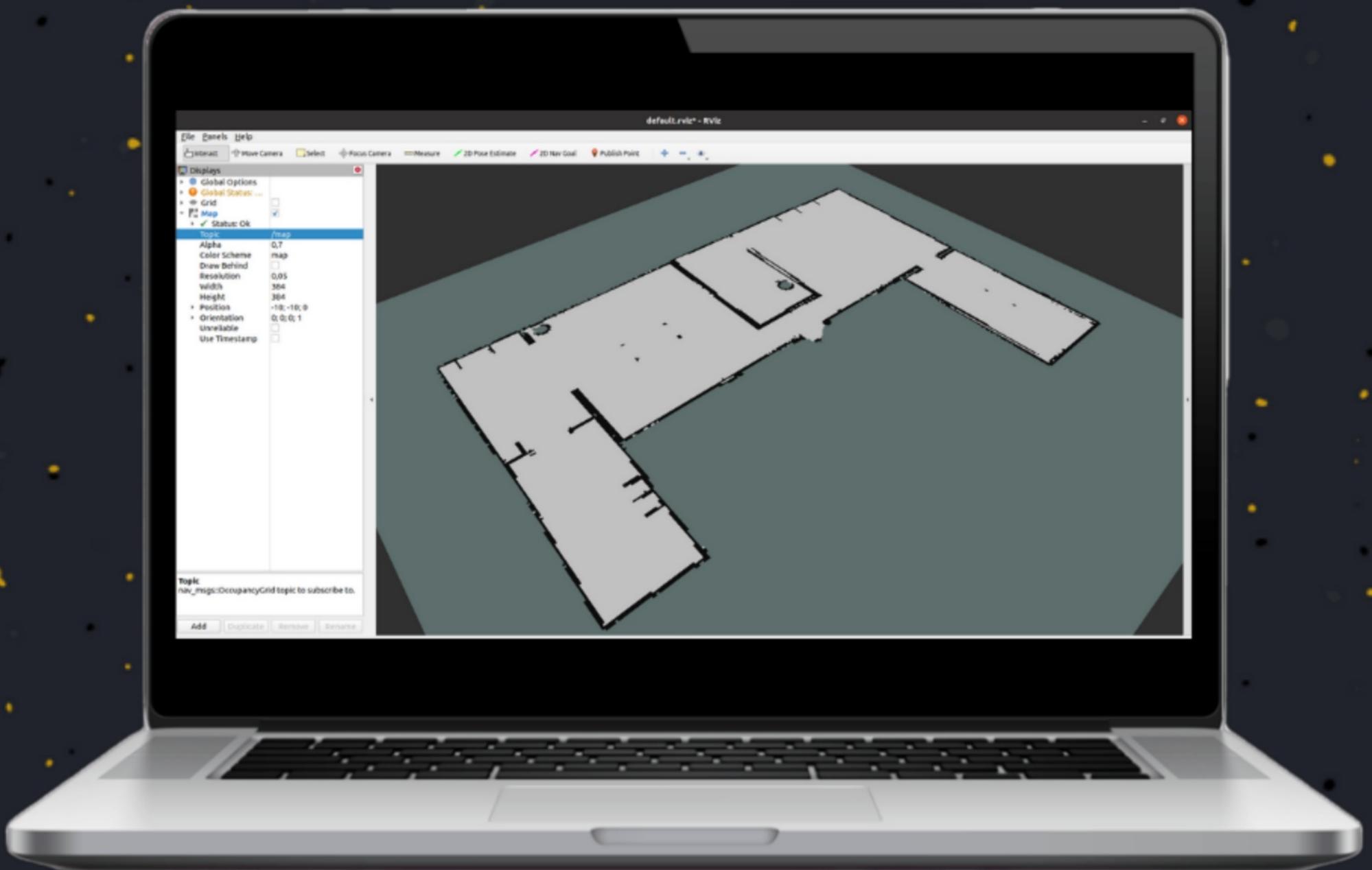


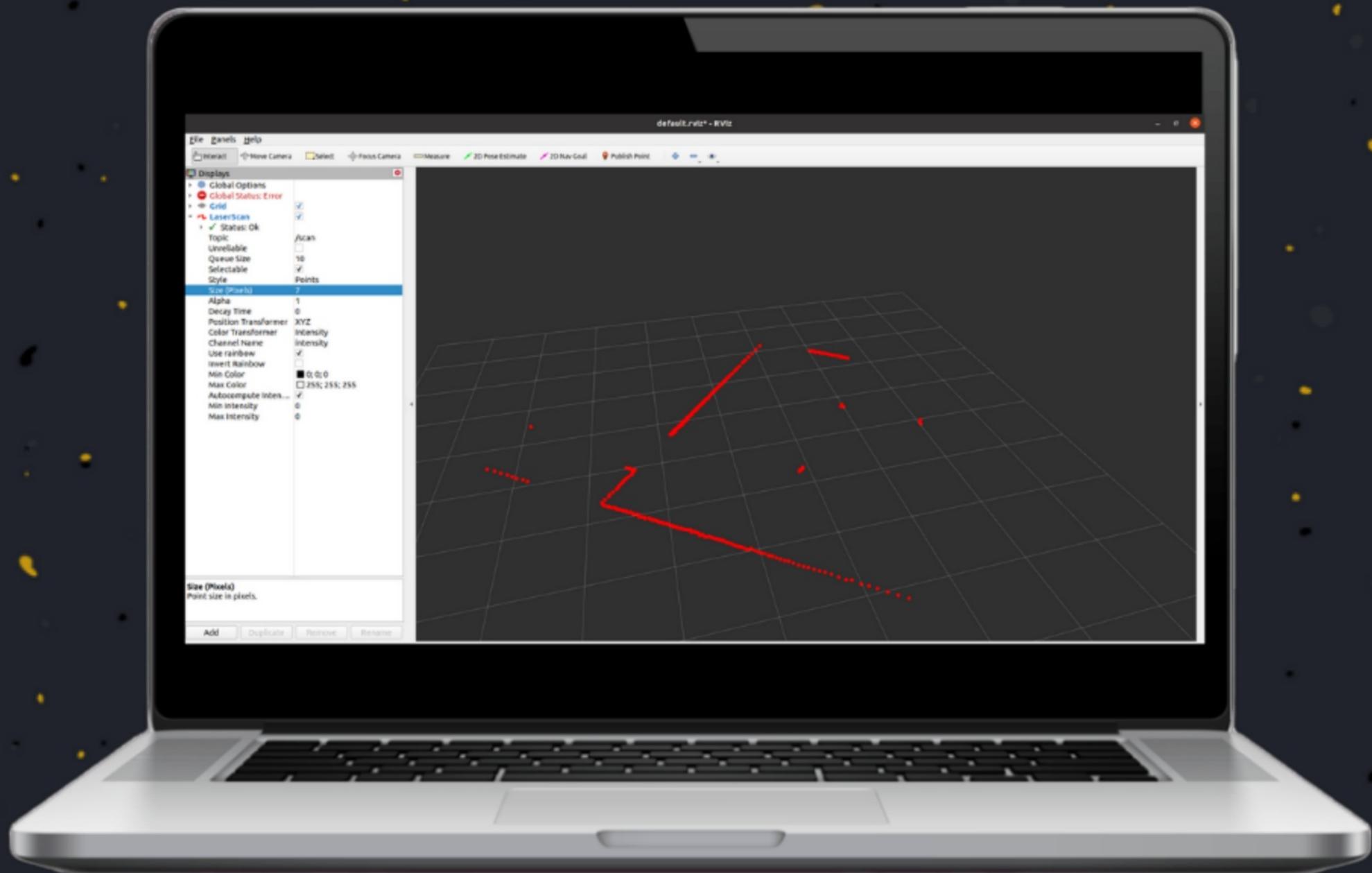
RViz 2 - ROS 2 Visualization

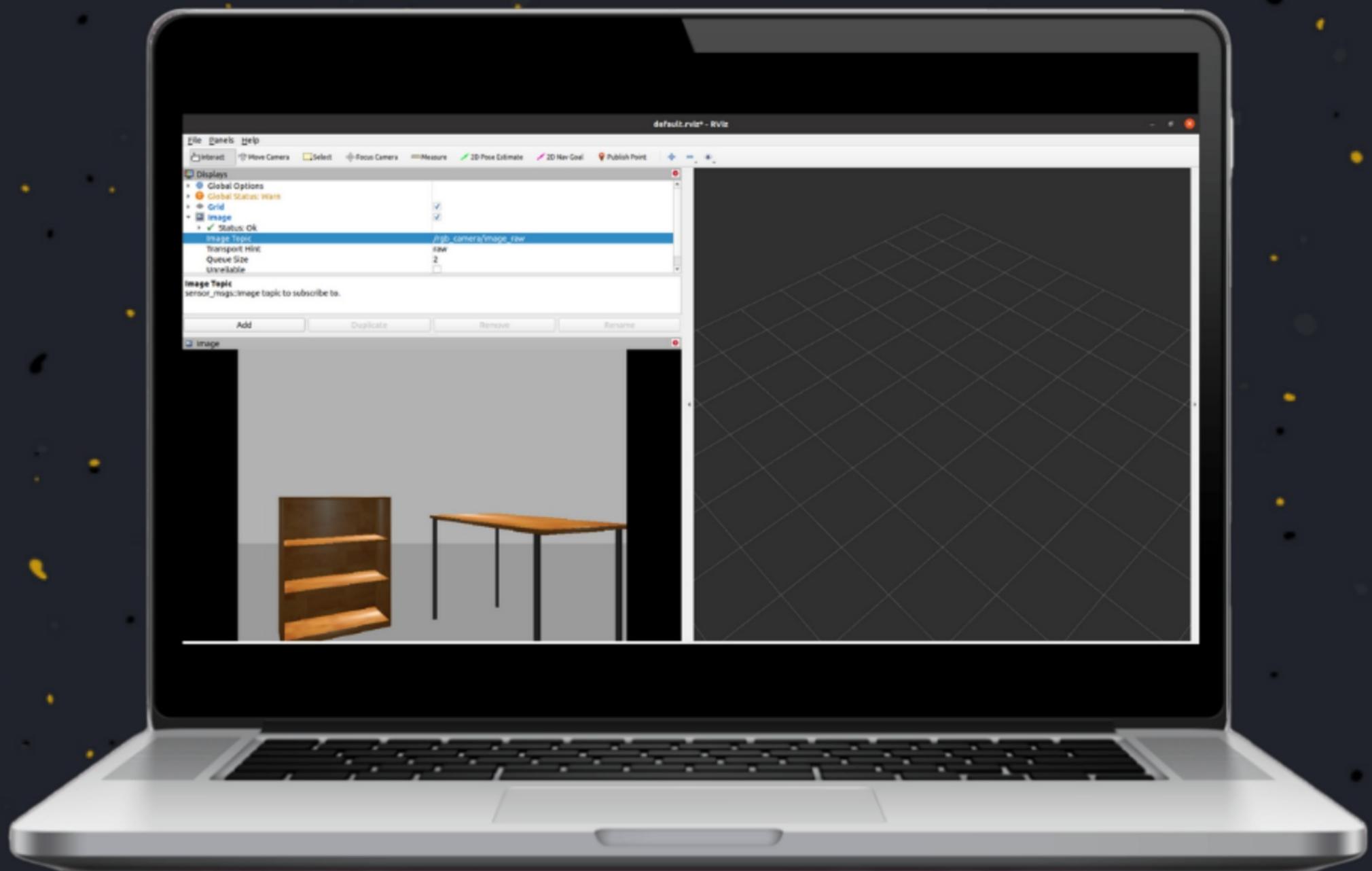


RViz 2 - ROS 2 Visualization

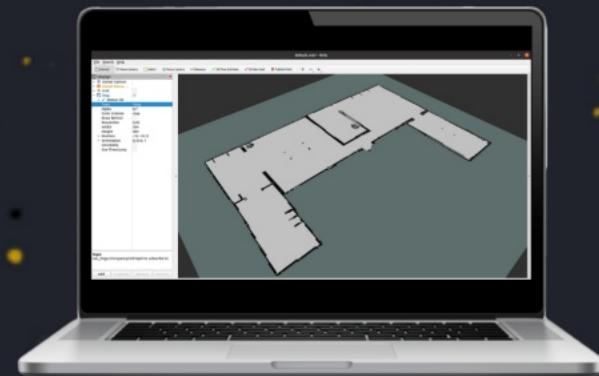
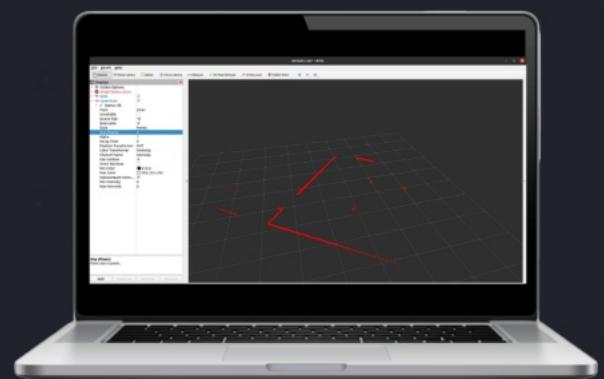
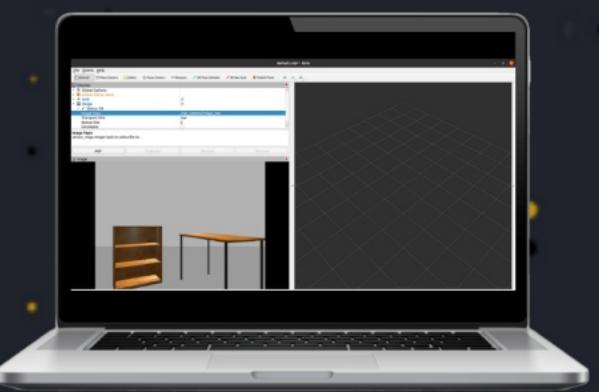








RViz 2 - ROS 2 Visualization





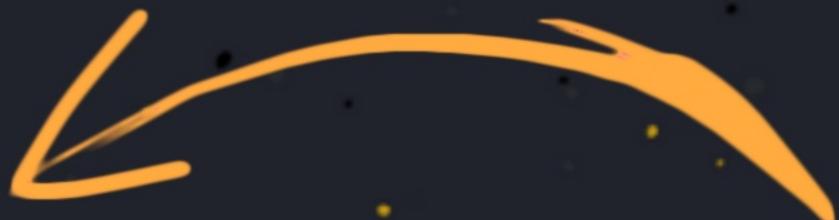
Model

Simulate

Visualize

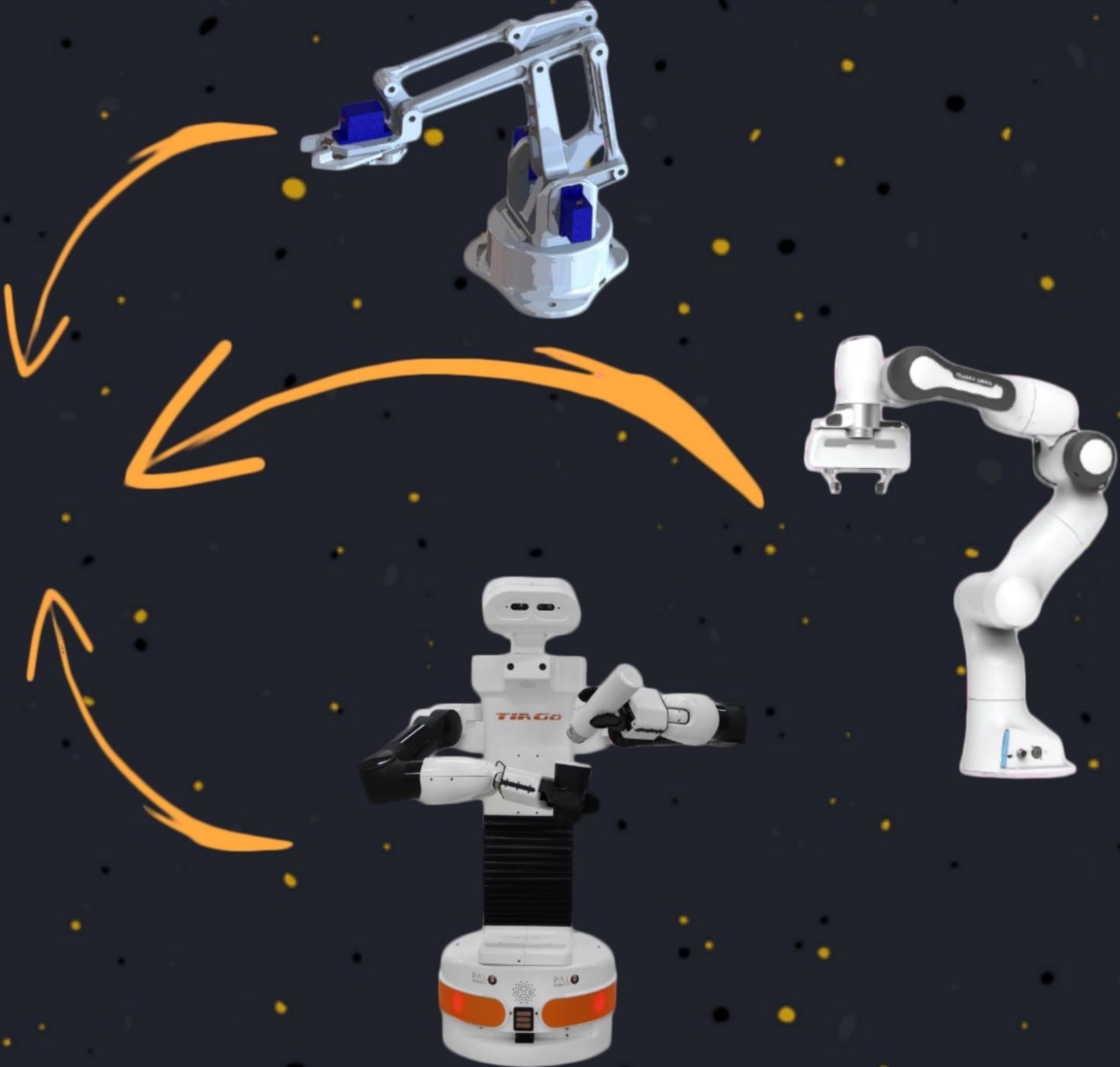
Parameters

> **MoveIt2**



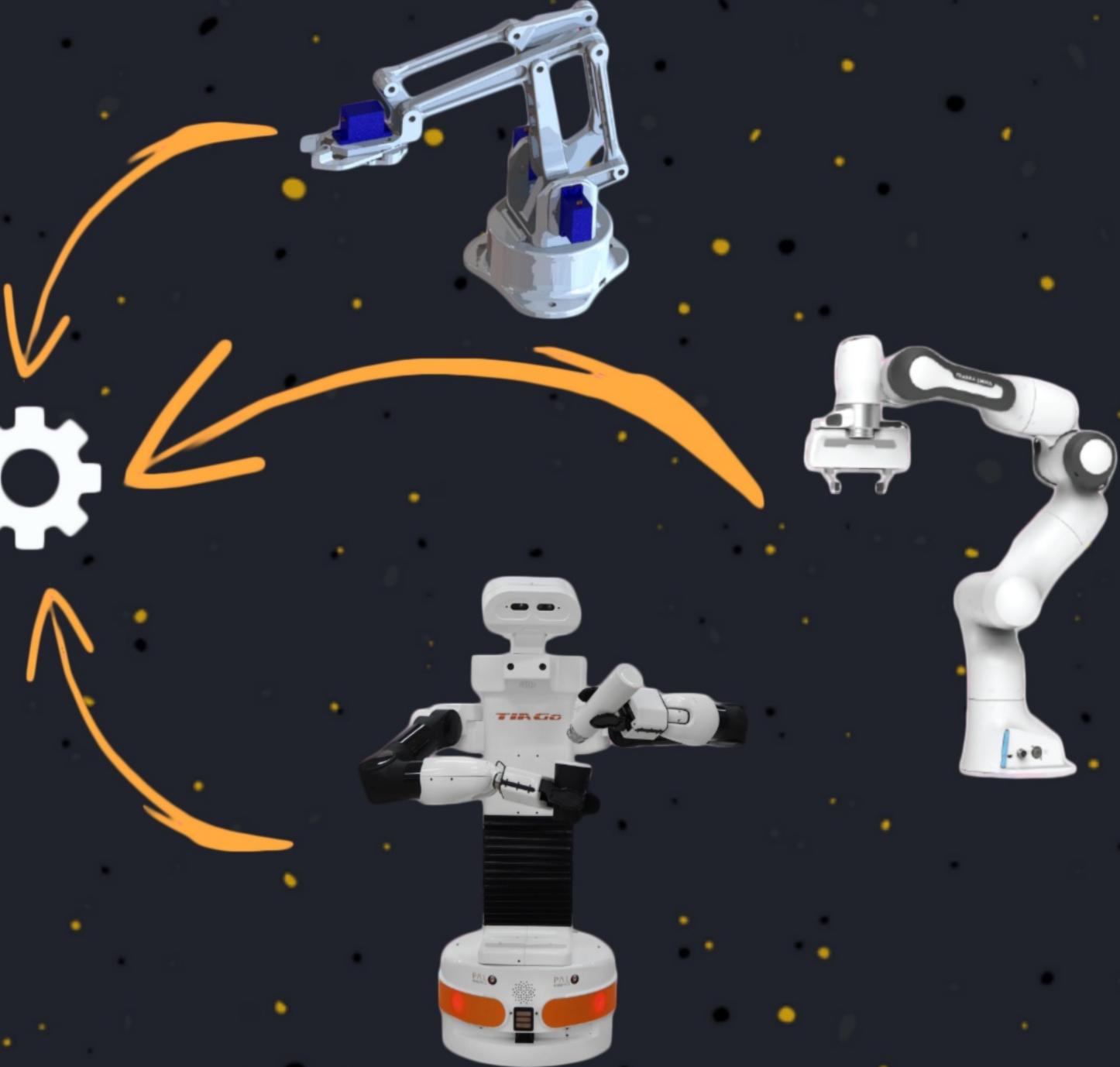
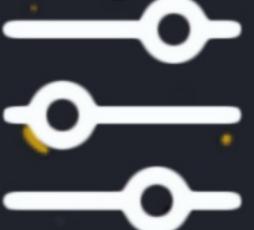
Parameters

> **MoveIt2**



Parameters

> **MoveIt2** 



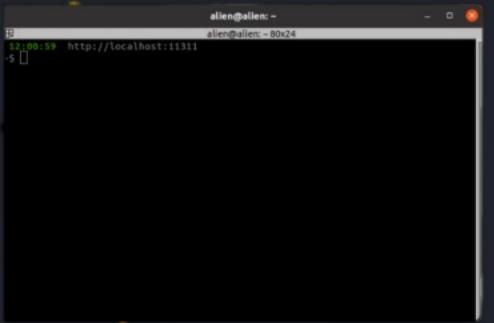


Model

Simulate

Visualize

Launch Files



ros2 node

Launch Files



ros2 node

ros2 node

Launch Files

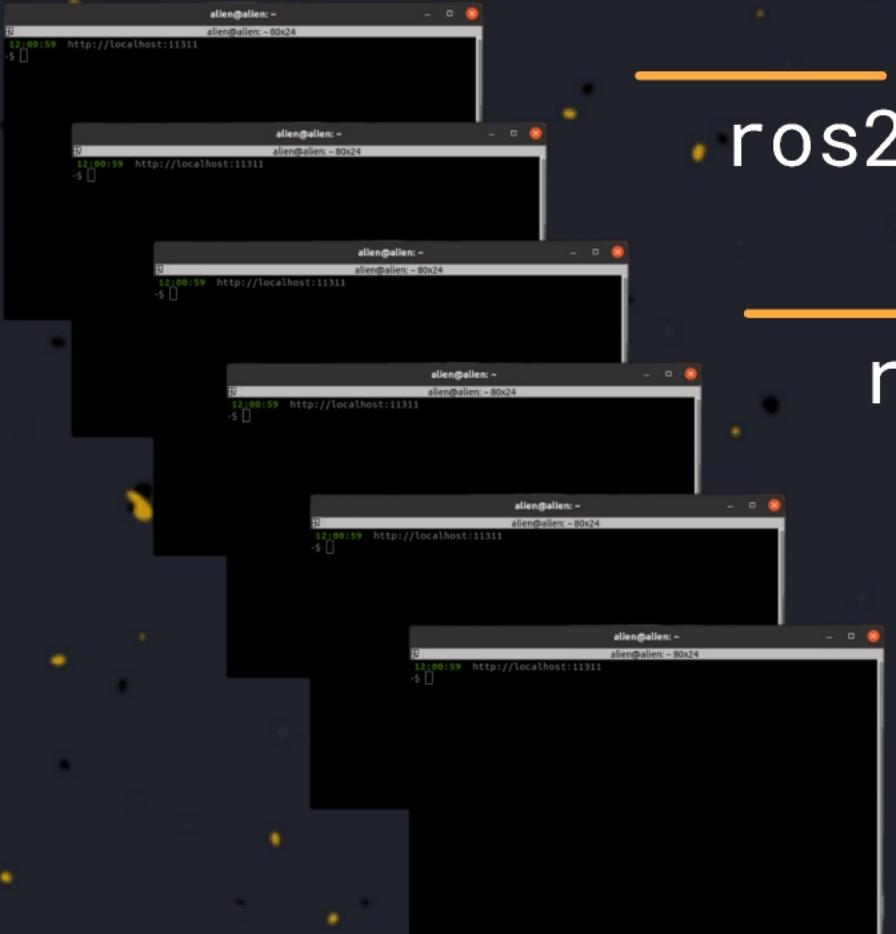


ros2 node

ros2 node

ros2 param

Launch Files



ros2 node

ros2 node

ros2 param



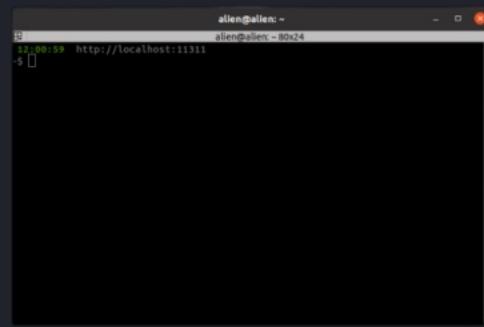
Launch

Launch

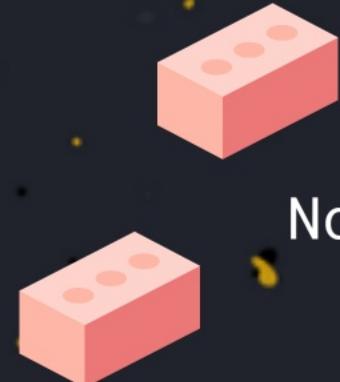


ros2 launch

Launch

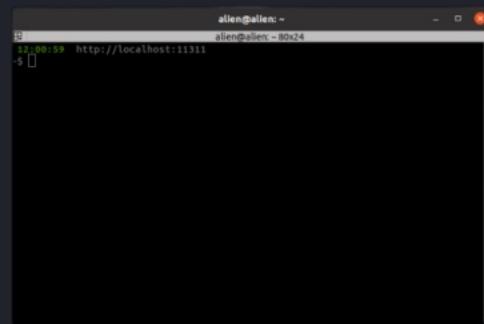


ros2 launch



Nodes

Launch



ros2 launch



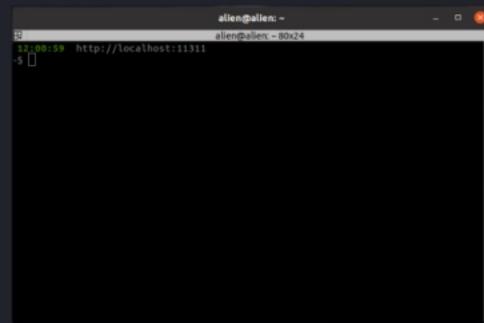
Nodes



Parameters



Launch



ros2 launch



Nodes



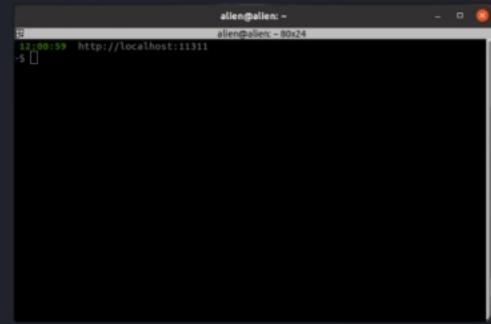
Parameters



Processes



Launch



ros2 launch



Nodes



Launch
Files



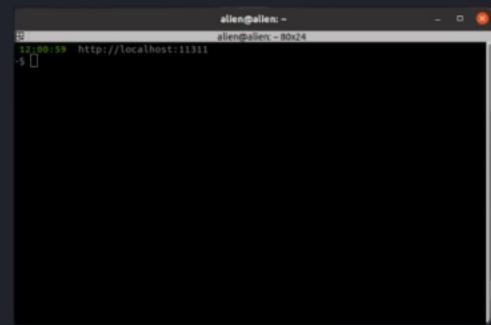
Parameters



Processes



Launch



—
ros2 launch



Nodes



Launch
Files



Parameters



Processes

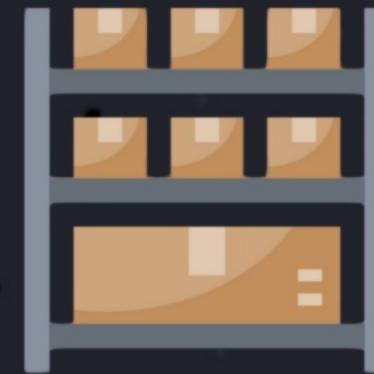


Launch Description

Launch Description

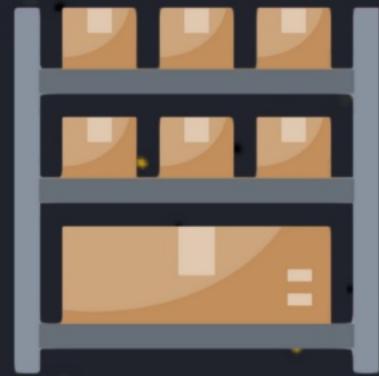


launch

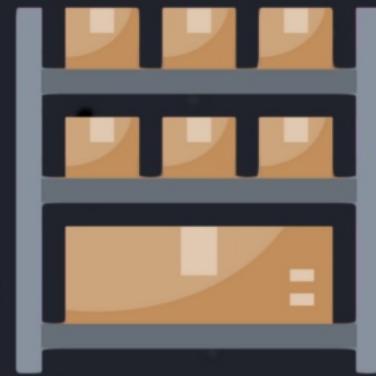


launch_ros

Launch Description



launch



launch_ros



actions



substitutions



event handlers



conditions

Launch Description



launch



launch_ros



actions



actions



substitutions



substitutions



event handlers



event handlers

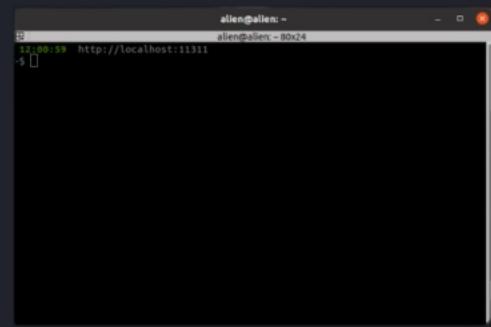


conditions



parameter_descriptions

Launch



—
ros2 launch



Nodes



Launch
Files



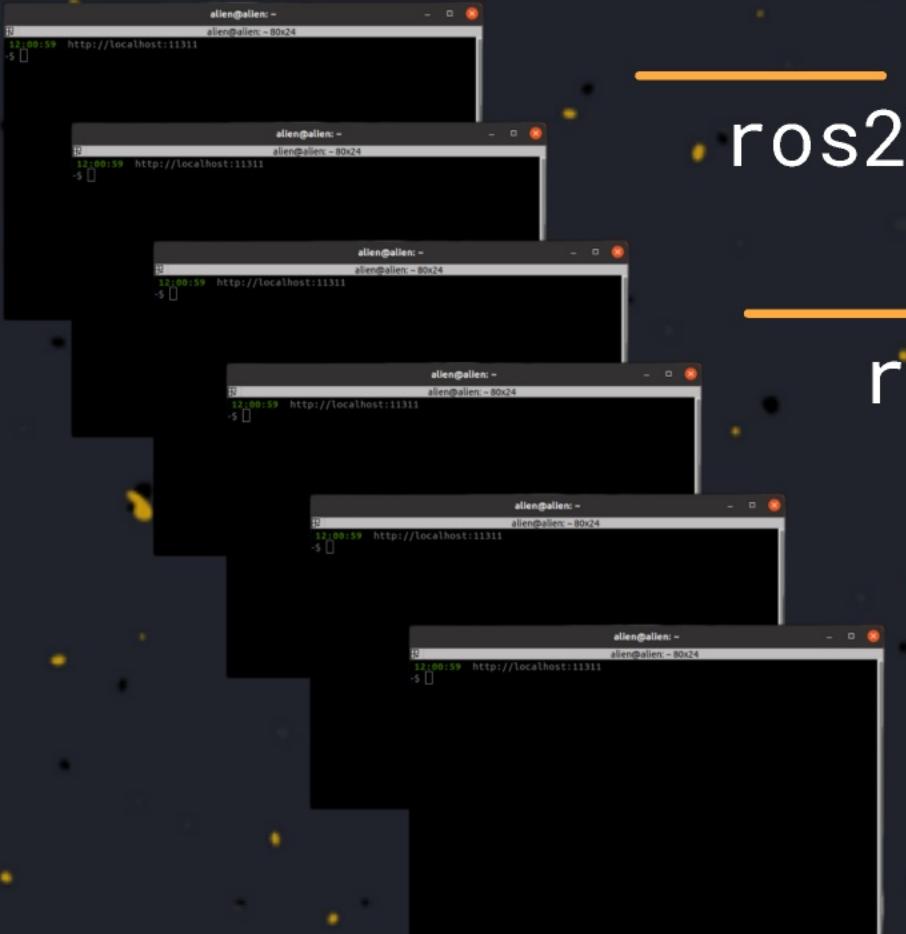
Parameters



Processes



Launch Files



ros2 node

ros2 node

ros2 param



Launch



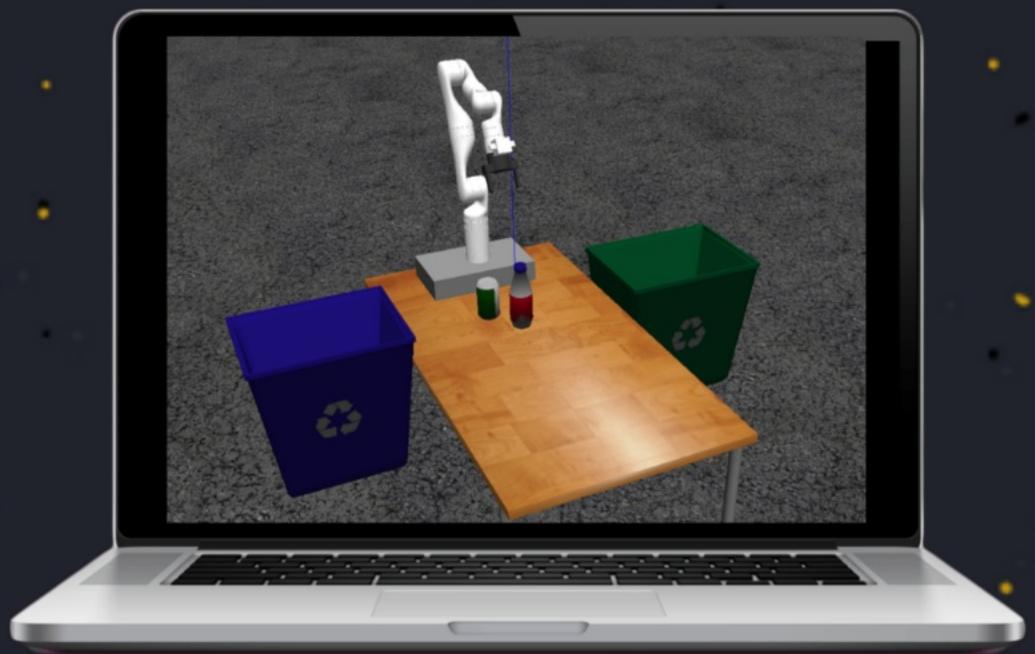
Model

Simulate

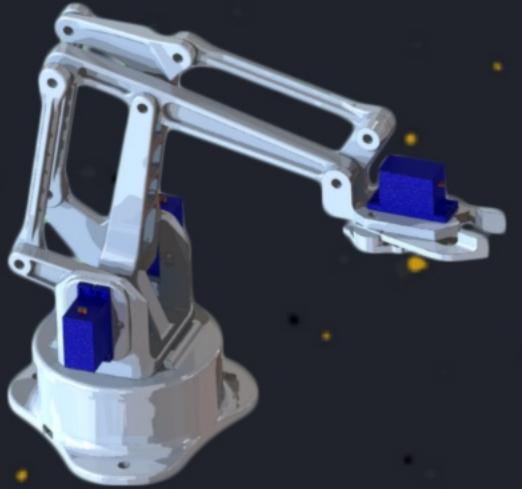
Visualize



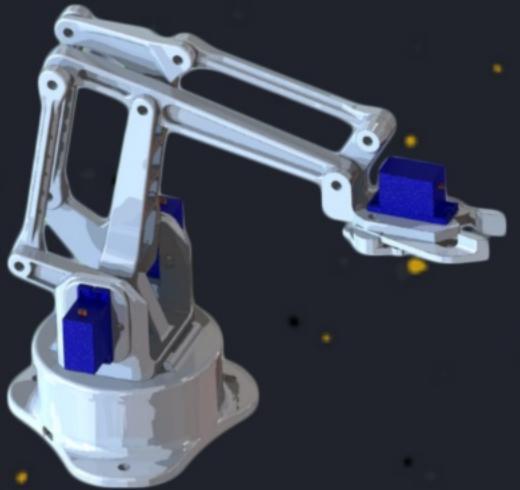
GAZEBO



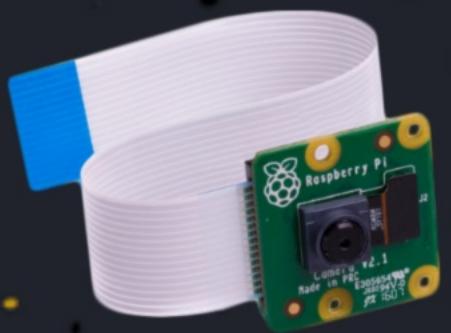




/joint_states



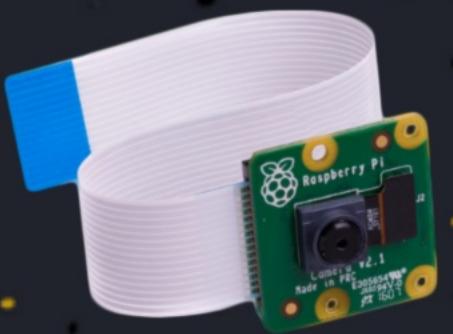
/joint_states



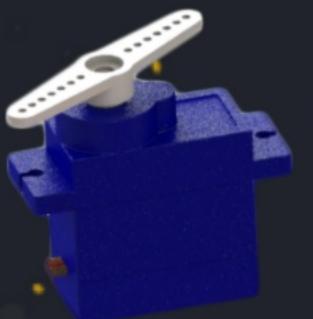
/camera



/joint_states



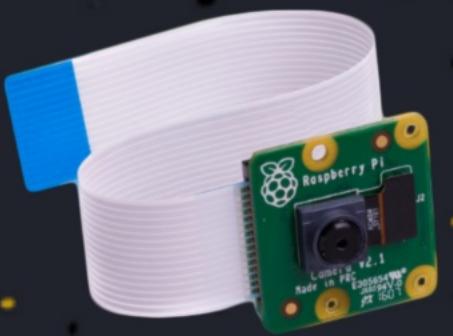
/camera



/motor



/joint_states



/camera



/motor





GAZEBO



/joint_states



/camera

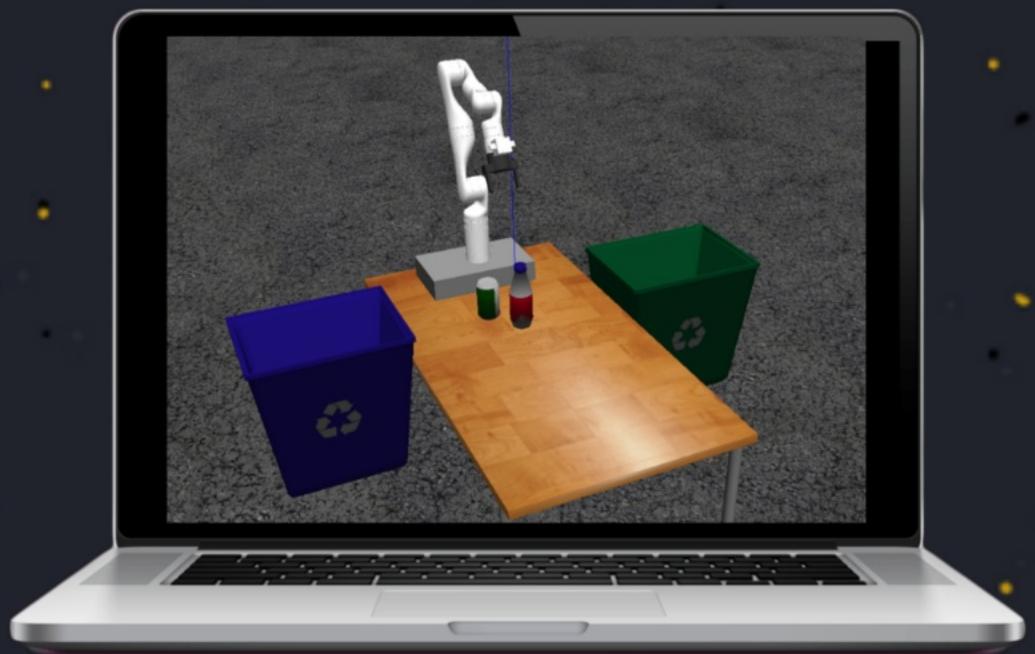


/motor





GAZEBO



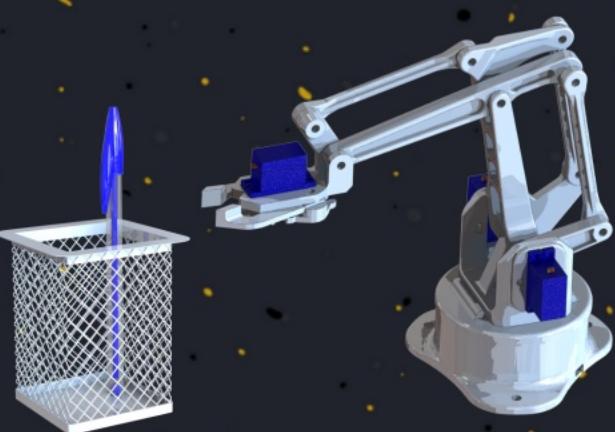
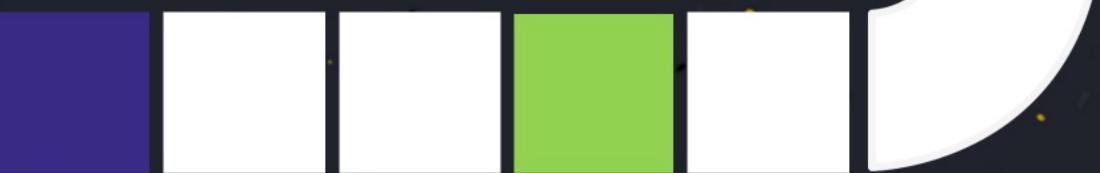
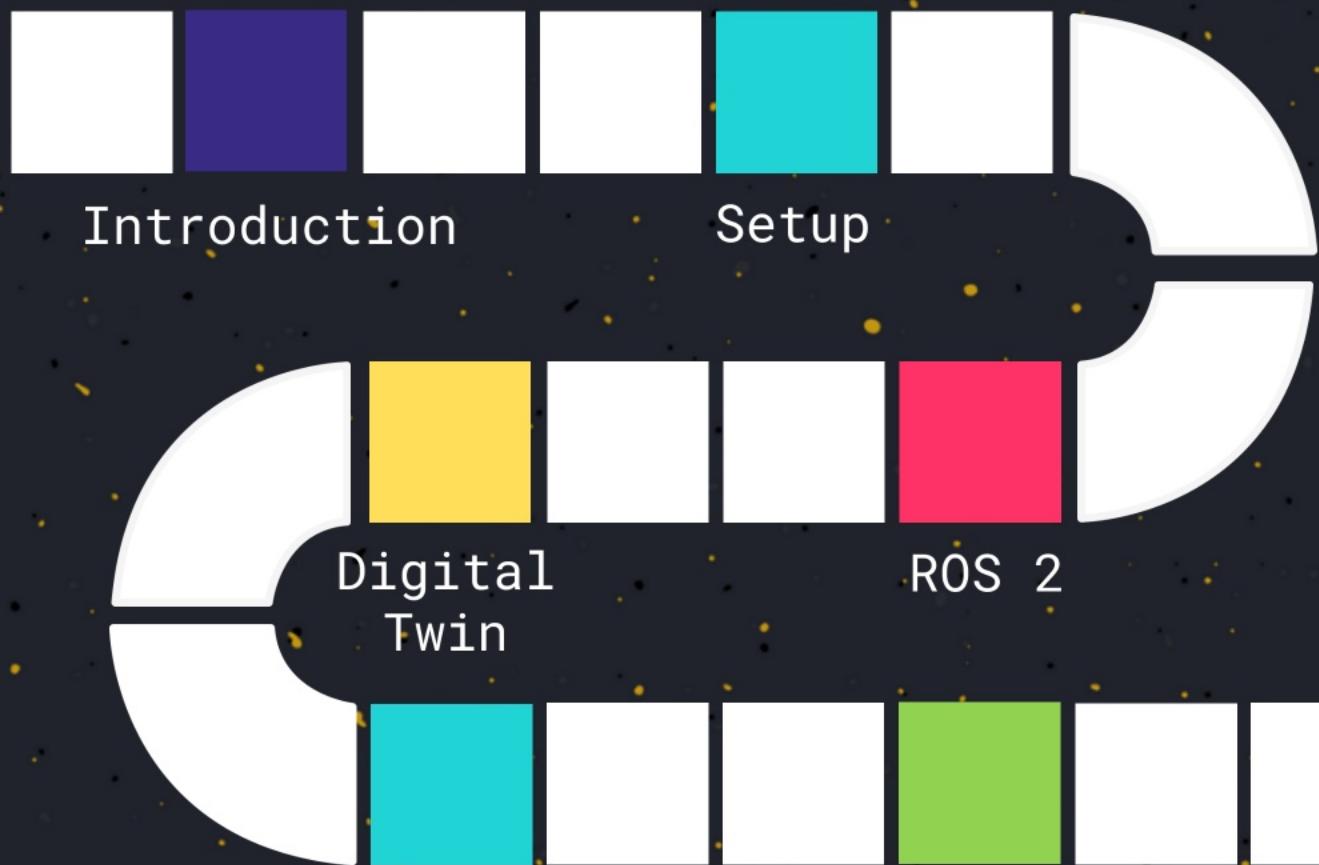


Model

Simulate

Visualize

Arduinobot



Conclusions

Build