URDF Model Quick Start

DR-xcobo 2.0 | v1.0 | ROS 1 / RViz

Load the robot model in RViz and explore its joints using interactive sliders. Keep the complete ZIP: the URDF needs all 10 STL mesh files to display the robot.

Environment

Ubuntu 20.04 LTS Desktop (Focal) + ROS 1 Noetic Ninjemys
Tools: RViz, catkin, and a Bash terminal.

Start with ROS Noetic and its package repository already installed and configured. Use the instructor-provided environment if available. This is a ROS 1 package; the commands below do not apply directly to ROS 2.

Target environment, not yet runtime-tested. The package files and mesh references have been checked. Noetic reached end of life on May 31, 2025; this guide documents the environment for the existing teaching package. Official sources are linked on page 2.

1. Install the required tools

In an Ubuntu Bash terminal, load ROS and install the visualization dependencies:

```
source /opt/ros/noetic/setup.bash
sudo apt update
sudo apt install build-essential unzip ros-noetic-catkin \
  ros-noetic-robot-state-publisher \
  ros-noetic-joint-state-publisher \
  ros-noetic-joint-state-publisher-gui ros-noetic-rviz
```

If /opt/ros/noetic/setup.bash is missing, obtain or install the course ROS environment first. These commands do not install a complete ROS distribution.

2. Download and build

Download the URDF ZIP (3.8 MB) and save it in **~/Downloads/**. Extract the complete package into the workspace:

```
mkdir -p ~/catkin_ws/src
unzip ~/Downloads/dr-xcobo-2.0-urdf-v1.0.zip -d ~/catkin_ws/src
cd ~/catkin_ws
catkin_make
source devel/setup.bash
```

The package path should be **~/catkin_ws/src/Dr_arm_6_desk/**, with **package.xml** directly inside it. Keep the package name and meshes folder unchanged. If using another catkin workspace, substitute its path. Extract the ZIP only once.

Launch & Explore

DR-xcobo 2.0 | RViz visualization

3. Start RViz and the joint sliders

In a new Bash terminal, load both environments, then launch the package:

```
source /opt/ros/noetic/setup.bash
source ~/catkin_ws/devel/setup.bash
roslaunch Dr_arm_6_desk display.launch
```

Two windows should open: **RViz** and **Joint State Publisher GUI**. The launch file also starts Robot State Publisher and starts the ROS master if needed. RViz is configured with **base_link** as the fixed frame.

For a static pose without the slider window, use:

```
roslaunch Dr_arm_6_desk display.launch gui:=false
```

4. Inspect the model

Camera: use RViz's Move Camera tool to orbit, pan, and zoom.
Joints: drag the sliders in the separate GUI to inspect direction and range.
Frames: select **Add > TF** in RViz to show the link coordinate frames.
Stop: press **Ctrl+C** in the terminal that launched the package.

The model has 10 links and 9 joints: 6 revolute, 2 prismatic, and 1 fixed. The two finger joints are independently controlled. End-effector planning requires MoveIt; gravity and contact simulation require a separate simulator setup.

Troubleshooting

Package not found: check the folder path, run catkin_make, and source ~/catkin_ws/devel/setup.bash in the current terminal.

Robot or meshes missing: verify that the full meshes folder was extracted. Enable RobotModel and set Robot Description to robot_description.

Fixed frame error: set Global Options > Fixed Frame to base_link and check the launch terminal for node errors.

Slider window missing: install ros-noetic-joint-state-publisher-gui and launch without gui:=false.

Model scope: the original URDF and meshes are unchanged. Movable joints have zero effort and velocity limits; review these before planning, controller use, or physical simulation. This download provides model visualization only.

Resources

Course resources | Complete URDF ZIP
ROS REP 3: Noetic target platforms | Official Noetic end-of-life notice

URDF 模型快速入门

DR-xcobo 2.0 | v1.0 | ROS 1 / RViz | 中文版

在 RViz 中加载机器人模型，通过交互式滑块查看关节运动。请保留完整 ZIP 功能包：URDF 需要全部 10 个 STL 网格文件才能完整显示机器人。

运行环境

Ubuntu 20.04 LTS 桌面版（Focal）+ ROS 1 Noetic Ninjemys
所需工具：RViz、catkin 和 Bash 终端。

开始前，请先安装并配置好 ROS Noetic 及其软件源；如有教师提供的环境，建议直接使用。本包适用于 ROS 1，以下命令不能直接用于 ROS 2。

此为目标环境，尚未进行实际运行测试；已核对功能包文件和网格引用。Noetic 已于 2025 年 5 月 31 日结束官方支持，本指南用于说明现有教学包的使用环境。官方参考资料见第 4 页。

1. 安装所需工具

打开 Ubuntu 的 Bash 终端，加载 ROS 环境并安装可视化依赖：

```
source /opt/ros/noetic/setup.bash
sudo apt update
sudo apt install build-essential unzip ros-noetic-catkin \
  ros-noetic-robot-state-publisher \
  ros-noetic-joint-state-publisher \
  ros-noetic-joint-state-publisher-gui ros-noetic-rviz
```

若找不到 /opt/ros/noetic/setup.bash，请先获取或安装课程所需的 ROS 环境。以上命令仅安装本包所需工具，并不会安装完整的 ROS 发行版。

2. 下载并编译

下载完整 URDF ZIP（3.8 MB），保存至 ~/Downloads/，然后将完整功能包解压到工作空间中：

```
mkdir -p ~/catkin_ws/src
unzip ~/Downloads/dr-xcobo-2.0-urdf-v1.0.zip -d ~/catkin_ws/src
cd ~/catkin_ws
catkin_make
source devel/setup.bash
```

功能包路径应为 ~/catkin_ws/src/Dr_arm_6_desk/，其目录内直接包含 package.xml。请勿更改包名或 meshes 文件夹。若使用其他 catkin 工作空间，请替换相应路径；ZIP 只需解压一次。

启动与操作

DR-xcobo 2.0 | RViz 可视化 | 中文版

3. 启动 RViz 和关节滑块

新建一个 Bash 终端，加载 ROS 和工作空间环境，再启动功能包：

```
source /opt/ros/noetic/setup.bash
source ~/catkin_ws/devel/setup.bash
roslaunch Dr_arm_6_desk display.launch
```

正常情况下会打开两个窗口：RViz 和 Joint State Publisher GUI。启动文件还会运行 Robot State Publisher，并在需要时自动启动 ROS master。RViz 的固定参考坐标系（Fixed Frame）已配置为 base_link。

若只需显示静态姿态、不打开滑块窗口，请先按 Ctrl+C 停止上一次启动，再运行：

```
roslaunch Dr_arm_6_desk display.launch gui:=false
```

4. 查看与操作模型

视角：使用 RViz 的 Move Camera 工具旋转、平移和缩放视图。
关节：在独立的 GUI 窗口拖动滑块，观察关节方向和运动范围。
坐标系：在 RViz 中选择 Add > TF，显示各连杆的坐标系。
退出：在执行启动命令的终端按 Ctrl+C。

模型包含 10 个连杆和 9 个关节：6 个转动关节、2 个移动关节、1 个固定关节。两侧手指关节独立控制。本包不含末端运动规划；如需此功能，应另行配置 MoveIt 等规划工具。重力和接触仿真需要单独配置仿真环境。

常见问题

提示找不到功能包：检查目录路径，运行 catkin_make，并在当前终端加载 ~/catkin_ws/devel/setup.bash。

机器人或网格未显示：确认 meshes 文件夹已完整解压；启用 RobotModel，将 Robot Description 设置为 robot_description。

固定参考坐标系报错：将 Global Options > Fixed Frame 设置为 base_link，并查看启动终端中的节点错误信息。

没有滑块窗口：安装 ros-noetic-joint-state-publisher-gui，并在启动时去掉 gui:=false。

模型使用范围：原始 URDF 和网格未改动，可动关节的力/力矩（effort）及速度限制值均为 0。用于规划、控制器或物理仿真前，须另行核对这些参数。本下载包仅用于模型可视化。

参考资料

课程资源页 | 完整 URDF ZIP
ROS REP 3：Noetic 目标平台 | Noetic 官方停止支持公告