

# Movelt Forward Kinematics Design

---

## Movelt Forward Kinematics Design

1. Usage Environment
2. Drive Real Robot
  - 2.1. Start Real Robot
  - 2.2. Launch Movelt2
3. Forward Kinematics Design
  - Launch Command

## 1. Usage Environment

---

Board: Jetson Orin Nano/Nx

ROS2: Humble

## 2. Drive Real Robot

---

Driving the real robot is done by subscribing to Movelt2's `/joint_states` topic and converting the robotic arm's joint state information into control of the real robotic arm.

**Note: Since the real robotic arm does not have obstacle avoidance functionality, some poses may collide with obstacles; therefore, try to make the planned robotic arm motions reasonable and avoid positions with obstacles**

**(It is recommended to use preset poses for driving the real robot demonstration)**

### 2.1. Start Real Robot

Without driving the real robot, perform simulation demonstration of robotic arm motion in Movelt:

```
ros2 run dofbot_pro_driver dofbot_pro_driver
```

### 2.2. Launch Movelt2

```
ros2 launch dofbot_pro_moveit demo.launch.py
```

```
Activities Terminator Mar 13 18:17 MAXN SUPER en
jetson@yahboom: ~
jetson@yahboom: ~ 132x19
[System Information]
ROS: humble
DOMAIN_ID: 25
IP_Address_1: 192.168.2.105
IP_Address_2: 172.17.0.1
jetson@yahboom:~$ ros2 run dofbot_pro_driver dofbot_pro_driver
[INFO] [1741861003.495313923] [joint_state_subscriber]: Subscribed to /joint_states
[INFO] [1741861013.856330900] [joint_state_subscriber]: Updated Joint Angles: [90.0, 90.0, 90.0, 90.0, 90.0, 30.0]

jetson@yahboom: ~ 132x19
[System Information]
ROS: humble
DOMAIN_ID: 25
IP_Address_1: 192.168.2.105
IP_Address_2: 172.17.0.1
jetson@yahboom:~$ ros2 launch dofbot_pro_moveit demo.launch.py
[INFO] [launch]: All log files can be found below /home/jetson/.ros/log/2025-03-13-18-16-51-406301-yahboom-28321
[INFO] [launch]: Default logging verbosity is set to INFO
[INFO] [robot_state_publisher-1]: process started with pid [28398]
[INFO] [move_group-2]: process started with pid [28400]
[INFO] [rviz2-3]: process started with pid [28402]
[INFO] [ros2_control_node-4]: process started with pid [28404]
[INFO] [spawner-5]: process started with pid [28406]
[INFO] [spawner-6]: process started with pid [28408]
[INFO] [spawner-7]: process started with pid [28411]
[robot_state_publisher-1] [WARN] [1741861012.984268463] [kdl_parser]: The root link base_link has an inertia specified in the URDF, but KDL does not support a root link with an inertia. As a workaround, you can add an extra dummy link to your URDF.
[robot_state_publisher-1] [INFO] [1741861012.984529204] [robot_state_publisher]: got segment Arm1_Link
[robot_state_publisher-1] [INFO] [1741861012.984665046] [robot_state_publisher]: got segment Arm2_Link
```

### 3. Forward Kinematics Design

Forward Kinematics refers to given the robotic arm's target pose (angles of each joint), and then MoveIt plans to the target pose by itself.

#### Launch Command

The robotic arm needs to be successfully loaded in MoveIt and `You can start planning now!` appears before running the following command: The robotic arm will plan to the target pose by itself

```
ros2 run dofbot_pro_moveit set_target_joints
```



