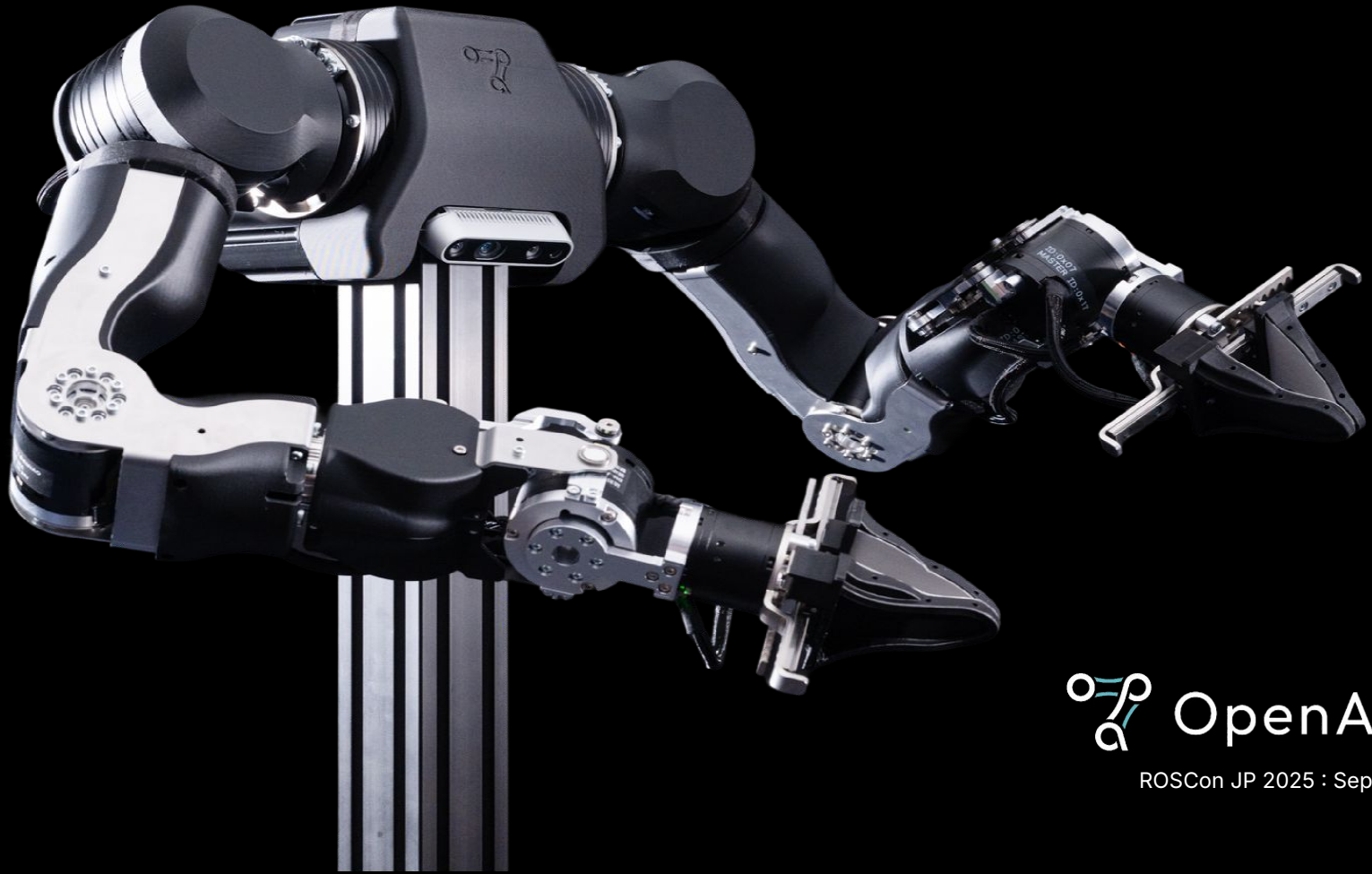


OpenArm

ROSCon JP 2025 : Sep 9, 2025

OpenArm

fully **open-source** humanoid robot for physical AI research and deployment in contact-rich environments.

7DOF
Bimanual Arms

633mm
Arm Reach

5.5kg
Weight per Arm

6.0kg
Peak Payload per Arm

1kHz
CAN-FD Control

$6,500
Bill of Materials

Project Overview

website : overview and visuals

docs : assembly guide and SDK tutorials

github CAD, code, and **issues**!

website

openarm.dev

Contribution Guide

GitHub Issues

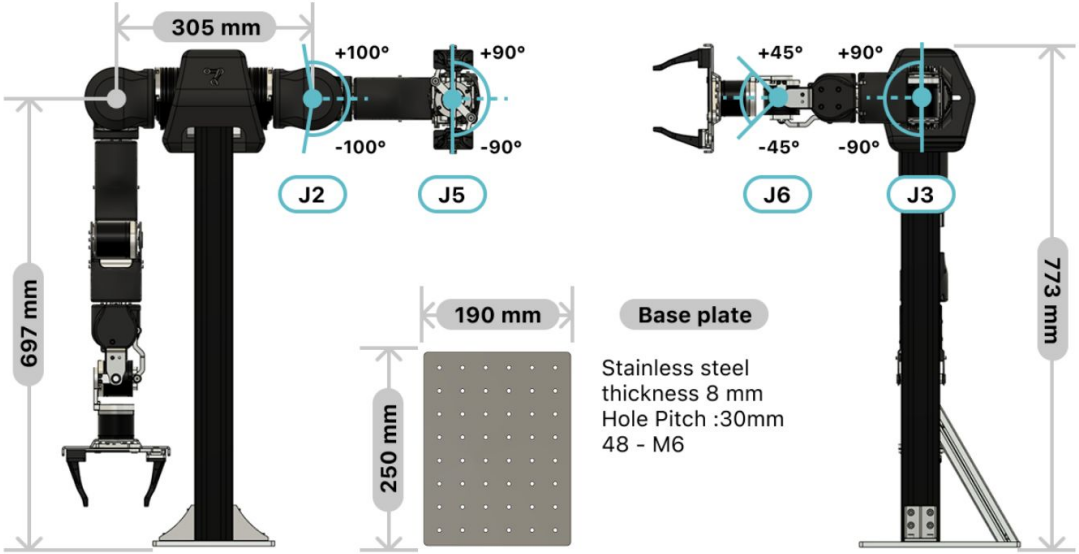
- enactic/openarm repo
- idea pool: project ideas, feature request, and tech issues.
- upvote, share ideas, and pickup unassigned issues

Discord

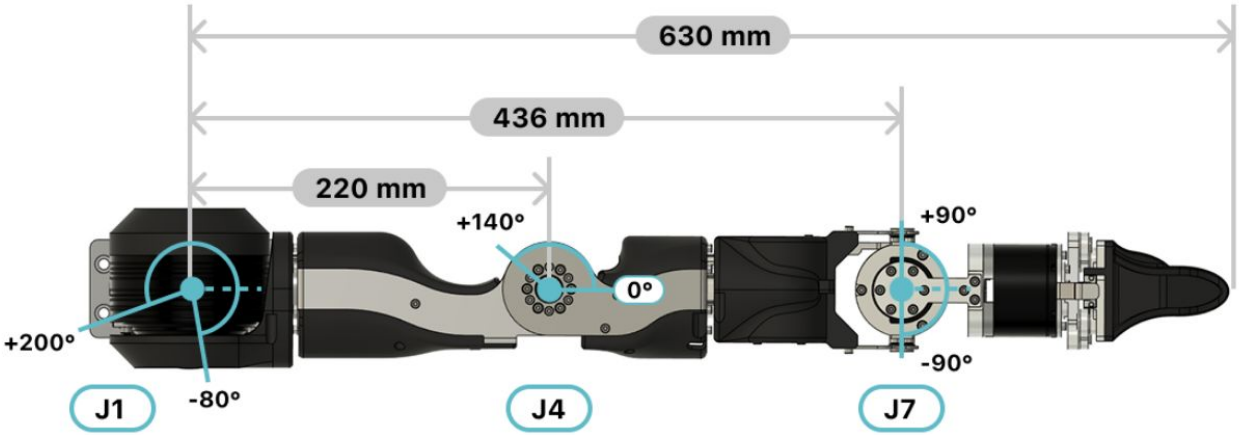
- connect and collaborate

Hardware

General Dimensions



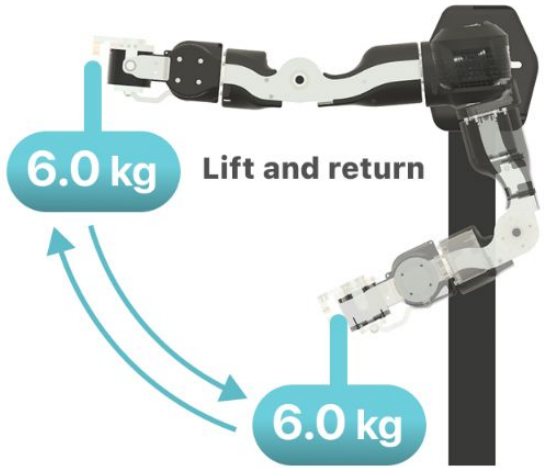
General Dimensions



Payload Definition

Nominal Payload

Peak Payload

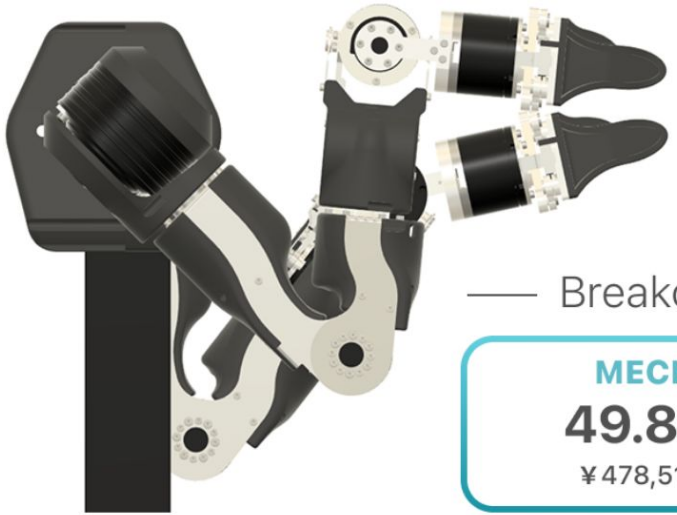


Two types of payload measurement experiments were conducted to more clearly demonstrate the payload

Motor Specifications

Configuration based on QDD motors

Make your own OpenArm



Total cost of body (2 Arms + 1 Pedestal)

¥960,438

≈$6,500

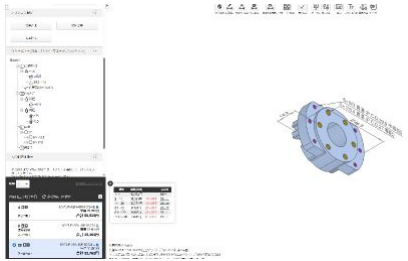
Breakdown of costs by category

MECH	MOTOR	ELEC
49.8%	41.4%	8.8%
¥478,518	¥397,356	¥84,564

Procuring Components

Mechanical Hardware

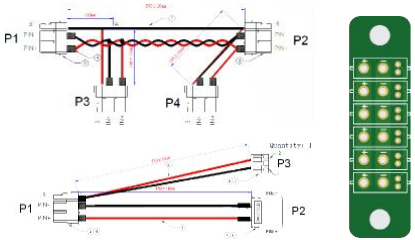
Model Numbers Provided!



MiSUMi meviy

Electrical Hardware

Drawings Provided!



LCSC J@LC JLCPCB

Motors

Enactic

All CAD and Electrical Drawings are on GitHub

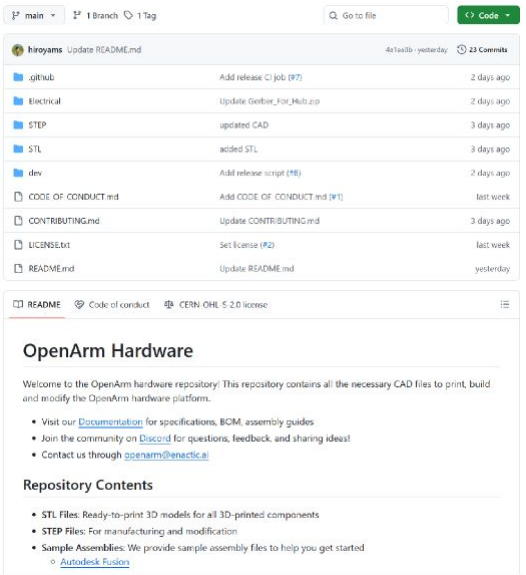
Easy to reference, edit, and manufacture !

Cables and PCB layouts

Complete Leader and Follower CAD!

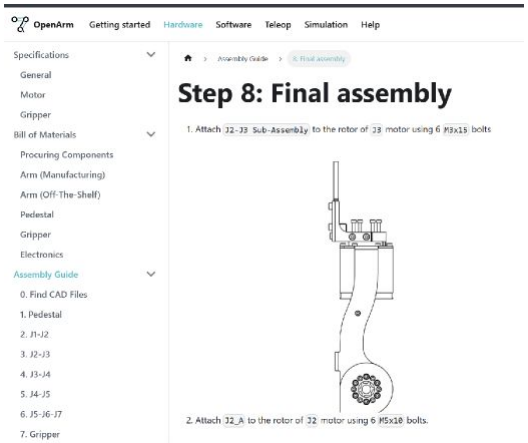
All 3D printed components

Sample Assembly

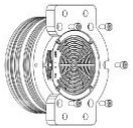


Assembly Guide

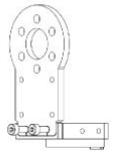
Easy to assemble!



Step 2: J1-J2 Sub-Assembly

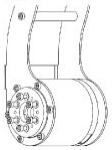


Step 3: J2-J3 Sub-Assembly

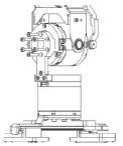


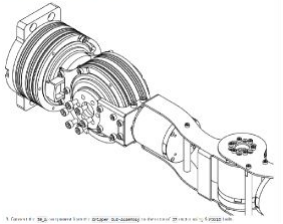
Step 4: J3-J4 Sub-Assembly

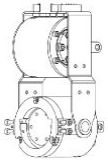
Step 5: J4-J5 Sub-Assembly



Step 6: J5-J6-J7 Sub-Assembly

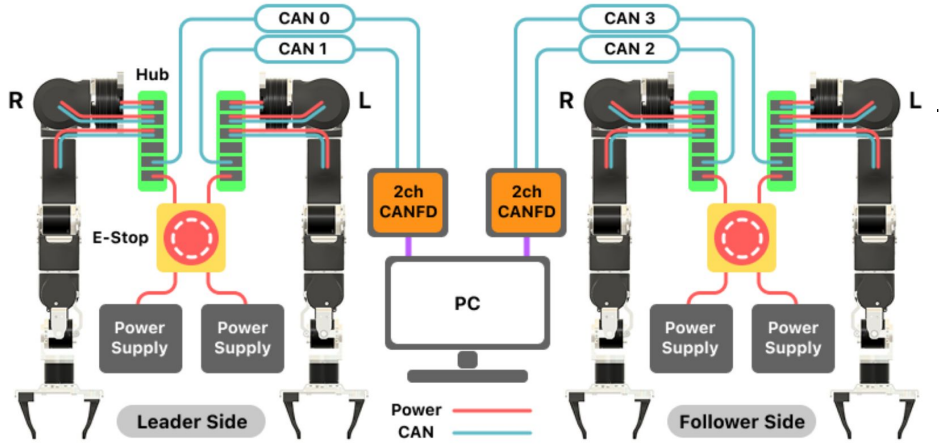




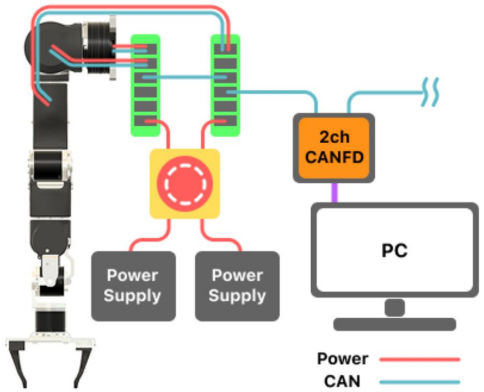


Wiring and Installation

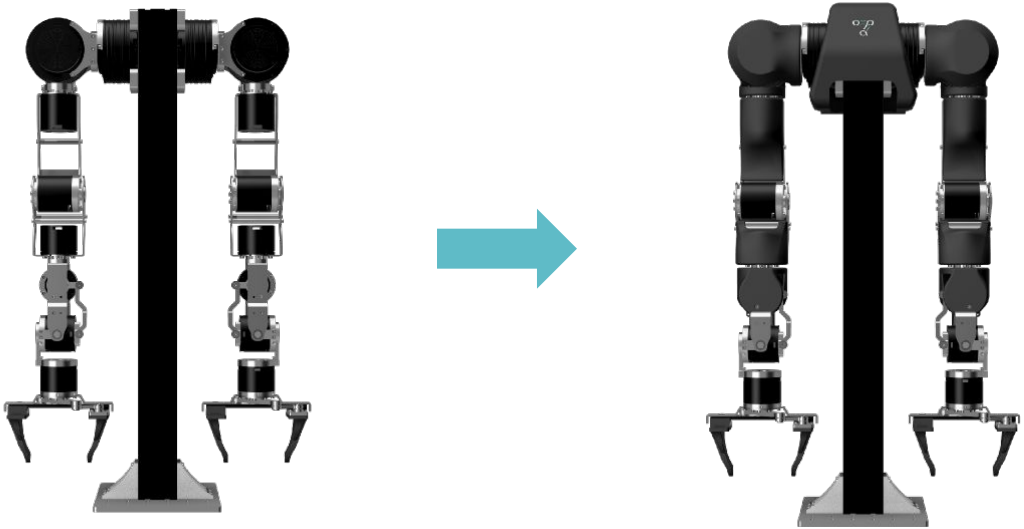
Only 5 cables per arm!



Higher Payload!



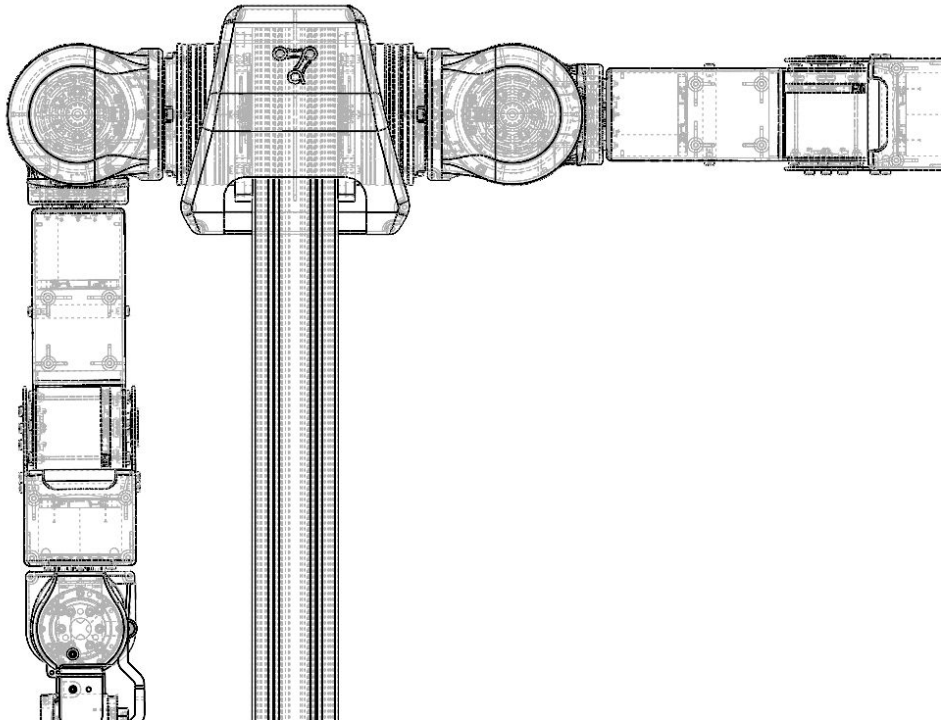
Casing



Software

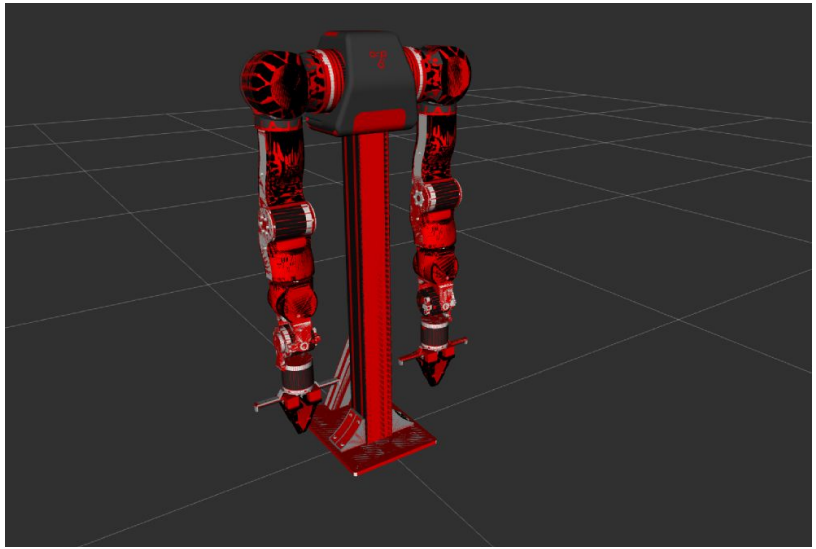
Software items

- Robot Description
- CAN Communication Library
- ROS2 Integration
- Teleoperation



Robot Description

- Modularized URDF
  - Parameterized xacros for easy configuration
  - Designing by components like "arm", "body", and "hand" improves scalability.
  - Already tested by KDL
  - Simplified Collision model



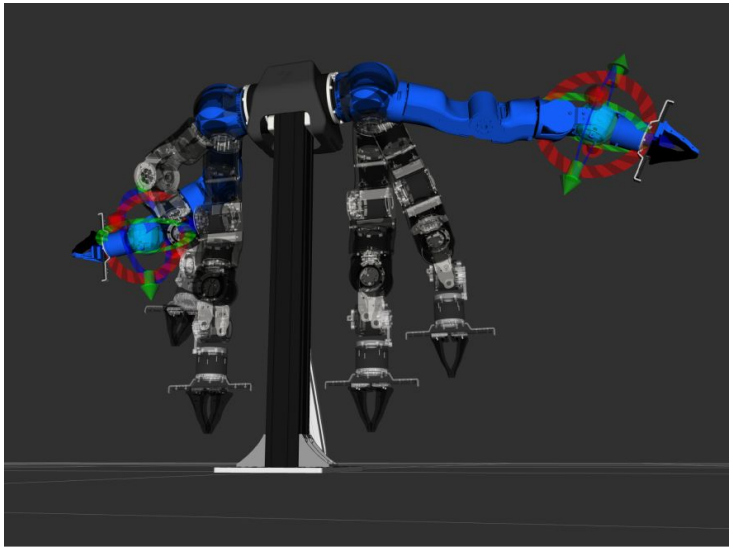
ROS2 Integration (WIP)

- ROS2 Controller

  Bridge the hardware and controllers

- MoveIt2

  Allows advanced kinematics and motion planning



Teleoperation

- Leader-Follower Teleoperation
  - Gravity compensation
  - Bilateral control

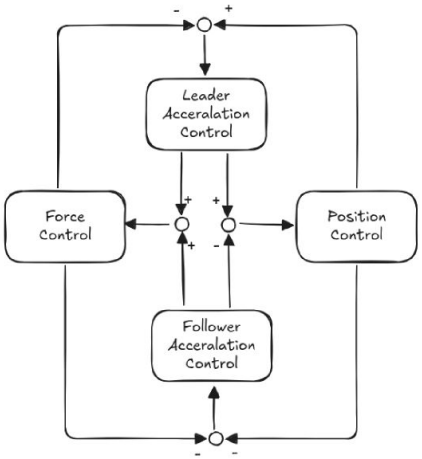
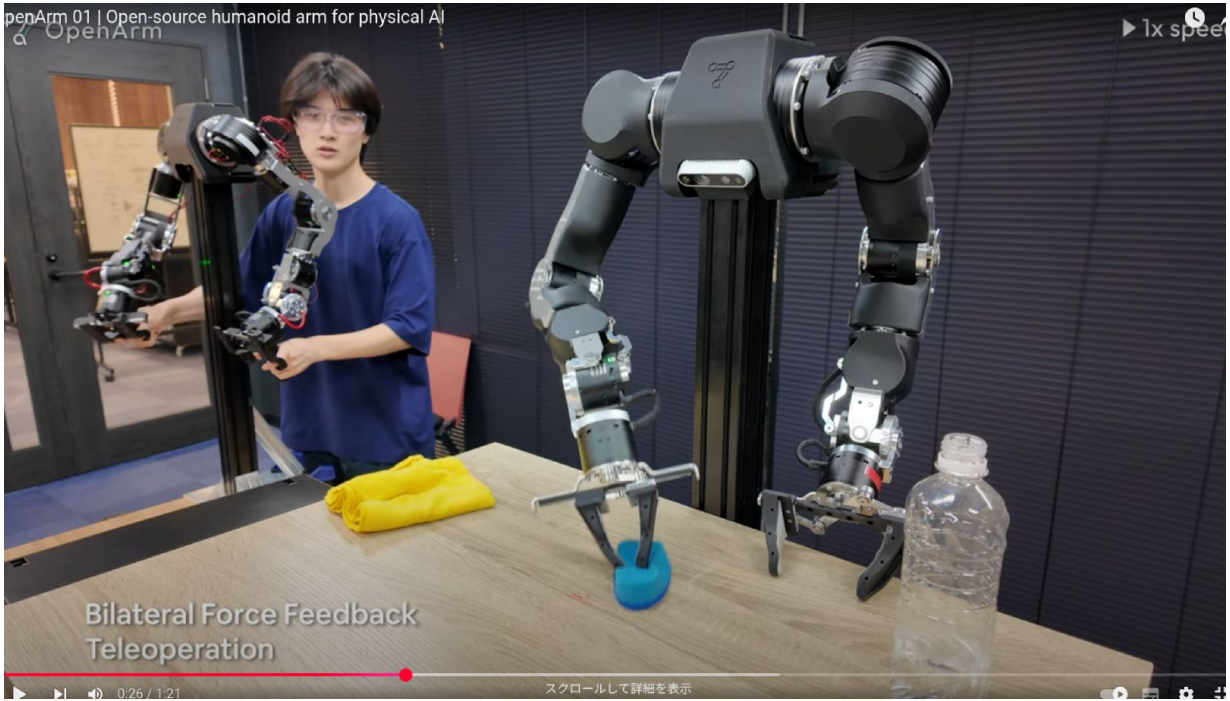


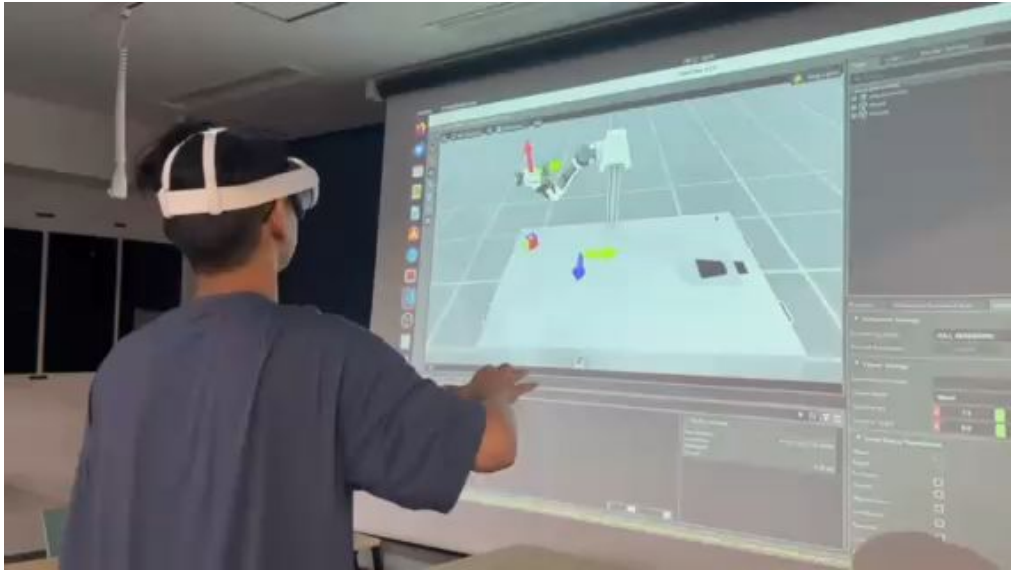
Fig: Bilateral control architecture

Teleoperation



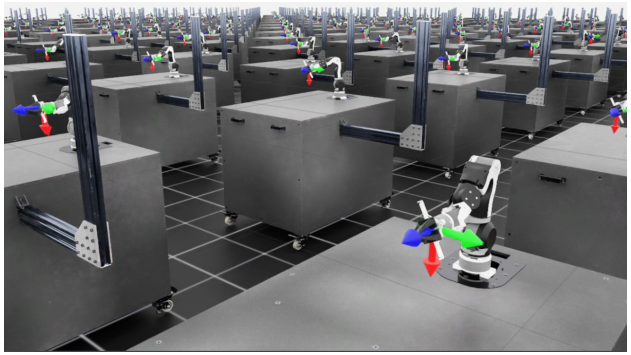
Teleoperation

- VR Teleoperation
  - integration with Meta Quest 3 (coming soon!)

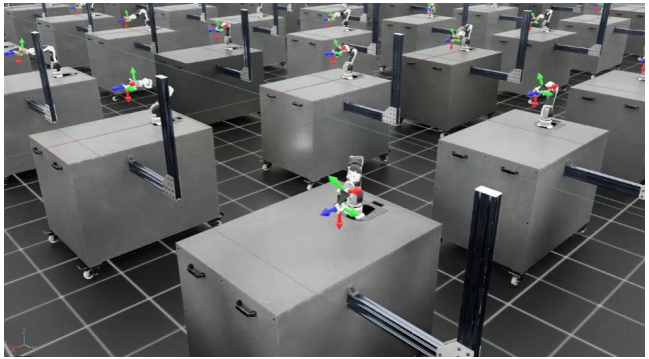


Simulation

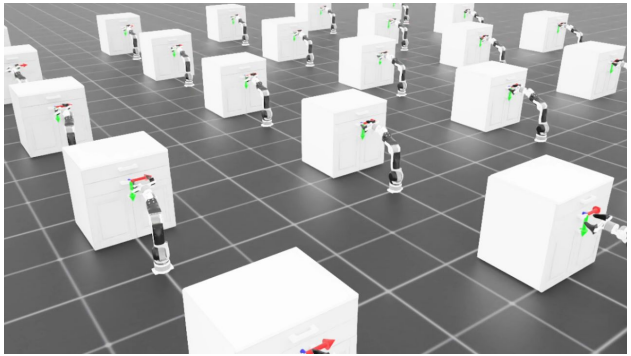
- Reinforcement Learning
  - Experiments on Isaac Lab (coming soon!)



Reach



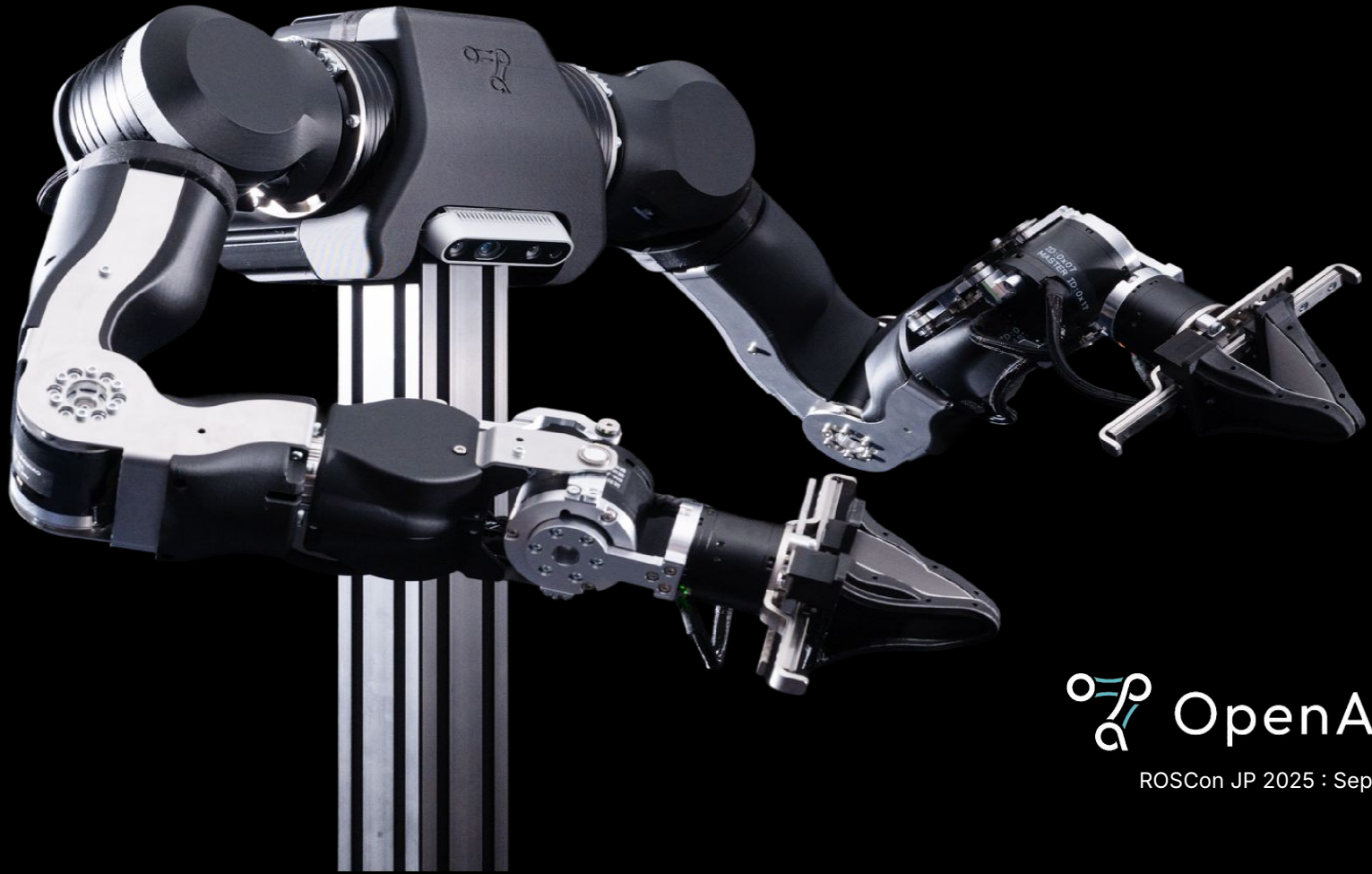
Lift cube



Open drawer

Simulation

- Mujoco support (WIP)



OpenArm

ROSCon JP 2025 : Sep 9, 2025