

The Future of Modular Actuators and Cost at Scale

The Strategy for Wide Adoption of Manipulators

ROBOTIS

We Provide Creativity



Modular Actuator is...



DRC

(DARPA Robotics Challenge)

15 teams as finalist built their own hardware

8 robots out of 15 used Dynamixel



DRC Finals - Qualified Teams

TEAM TARTAN RESCUE	TEAM AERO	TEAM AIST-NEDO	TEAM DRC-HUBO AT UNLV	TEAM GRIT
TEAM HECTOR	TEAM HKU	TEAM HRP2-TOKYO	TEAM IHMC ROBOTICS	TEAM INTELLIGENT PIONEER
TEAM KAIST	TEAM MIT	TEAM NEDO-HYDRA	TEAM NEDO-ISK	TEAM NIMBRO RESCUE
TEAM ROBOSIMIAN	TEAM ROBOTIS	TEAM SNU	TEAM THOR	TEAM TRAC LABS
TEAM TROOPER	TEAM VALOR	TEAM VIGIR	TEAM WALK-MAN	TEAM WPI-CMU



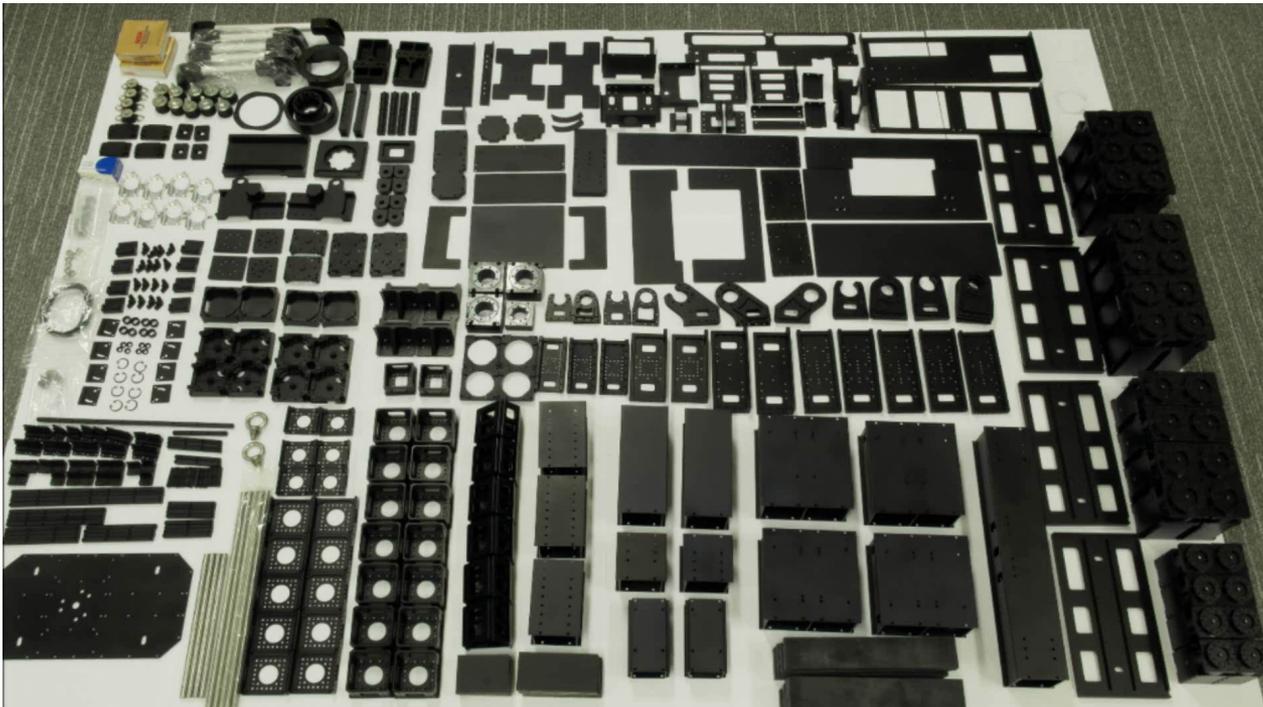
The Meaning of DRC

Video link:

<https://youtu.be/rs-5O746l7o>

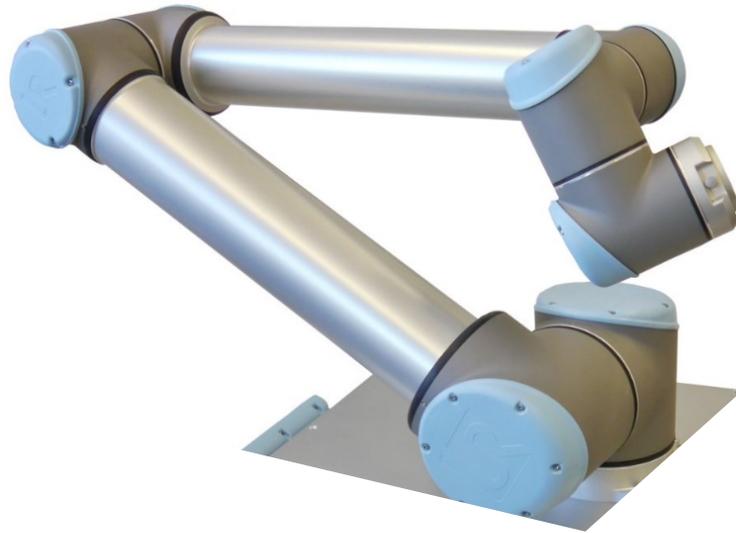


Applicability of Modular Actuator





Vs. Industrial Manipulators





Between inside factory and outside factory

What are different?

Characteristics of Service Robot

- ✓ Movable (Mobility)
- ✓ Unpredictable Environment (Collision, Falling)
- ✓ Small System (Optimal Capacity)

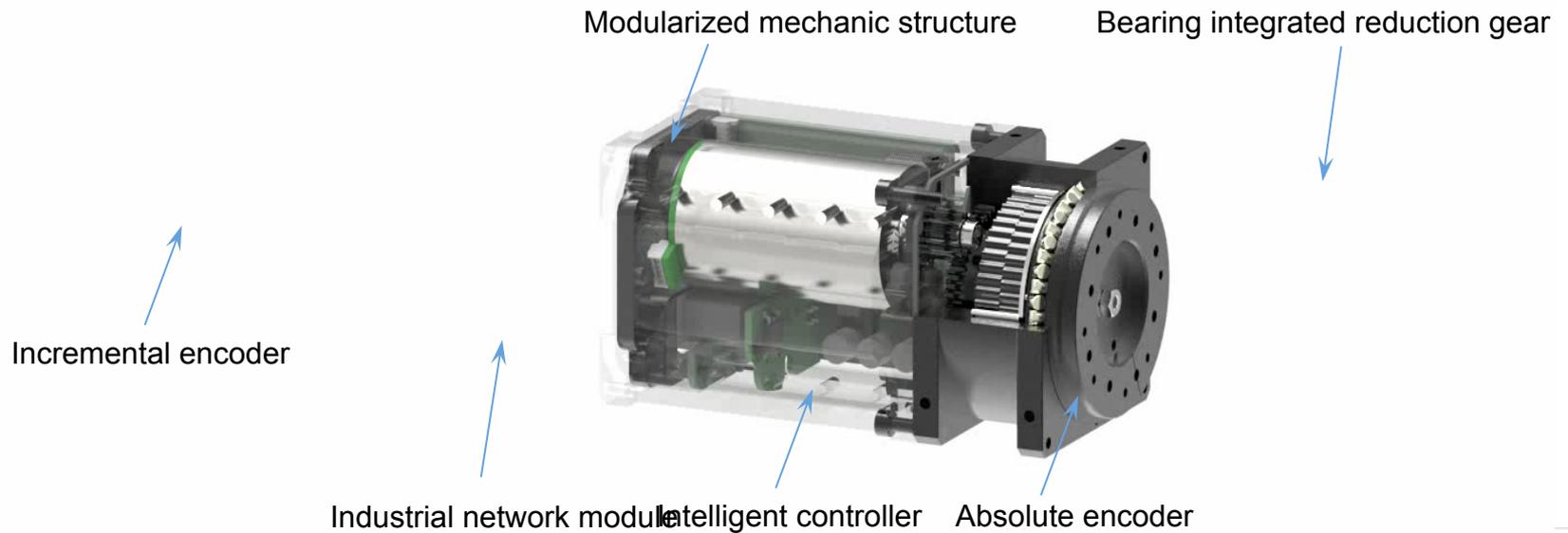
- Compact/Light Weighted
- Shock Resistance
- Energy efficiency





DYNAMIXEL

1. **Robot Exclusive** : Compact and lightweight for building robots. Best for battery-operated mobile robots that needs to be durable from collision.
2. **All-in-one** : sensors, drivers, network and reduction gears are integrated into the rectangular form factor
3. **Modular** : Modular structure for easy assembly and maintenance like block toys
4. **Network driven** : Driven through a network, allowing systematic control for complicated systems
5. **Actuator**





The question for future

Curiosity, Robotic Rover vs. Folded Laundries



“Which one is the problematic part?”



ROS-Moveit based Control

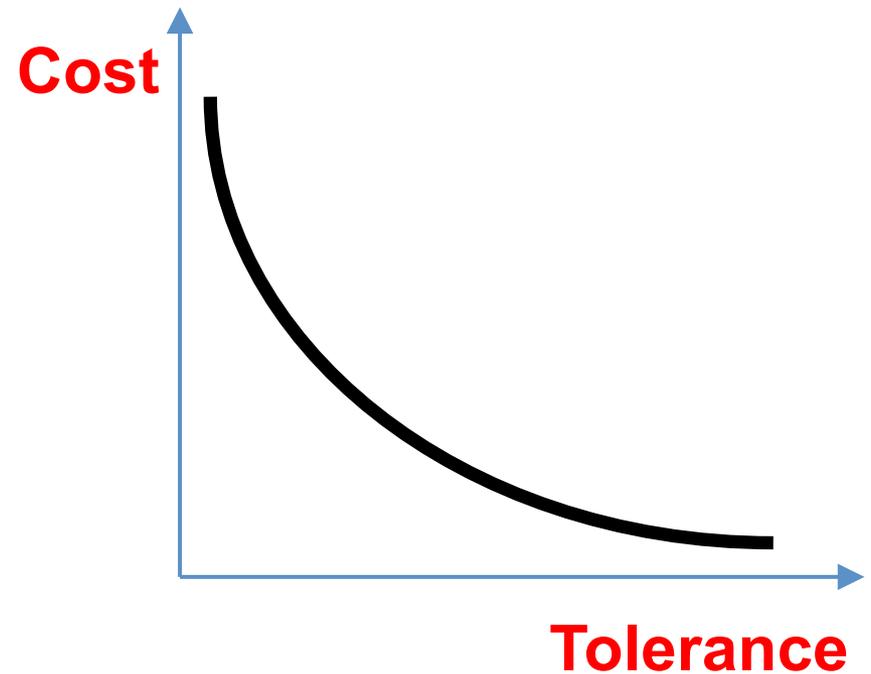
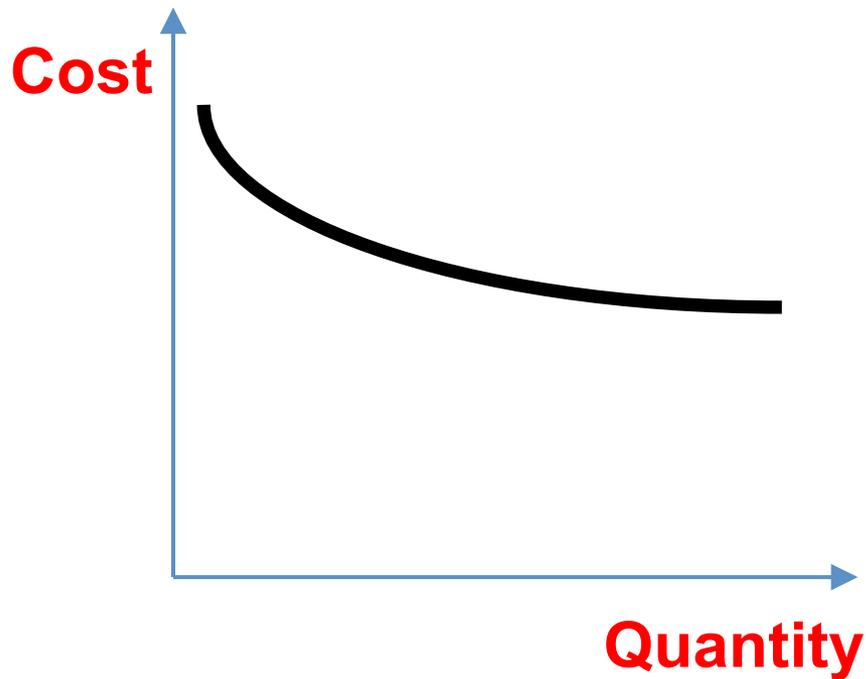
Video Links:

- https://youtu.be/cIVBfVO_ik0
- https://youtu.be/Gu9PLb7F_QU



Cost issue

Quantity vs. Accuracy





Strategical Meaning

Flexibility, Compatibility, Expandability and Accessibility



Open platform, modular concept



Conclusion





Thank you



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