

Movelt Survey Results



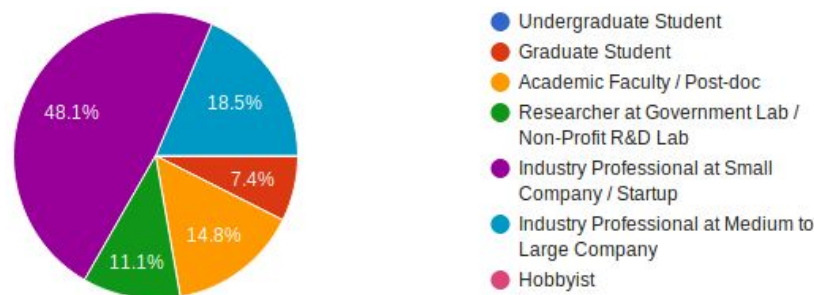
Reporting May 2019

Total no. of responses: 28

Total no. of different types of robots using Movelt: 126

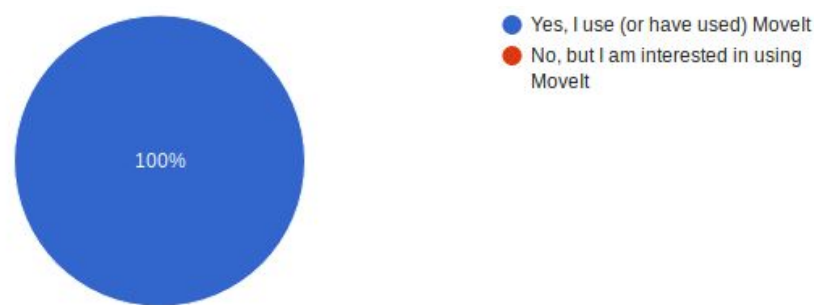
General Information

Which describes you best?



Undergraduate Student	0	0%
Graduate Student	2	7.4%
Academic Faculty/Post-doc	4	14.8%
Researcher at Government Lab / Non-Profit R&D Lab	3	11.1%
Industry Professional at Small Company / Startup	13	48.1%
Industry Professional at Medium to Large Company	5	18.5%
Hobbyist	0	0%

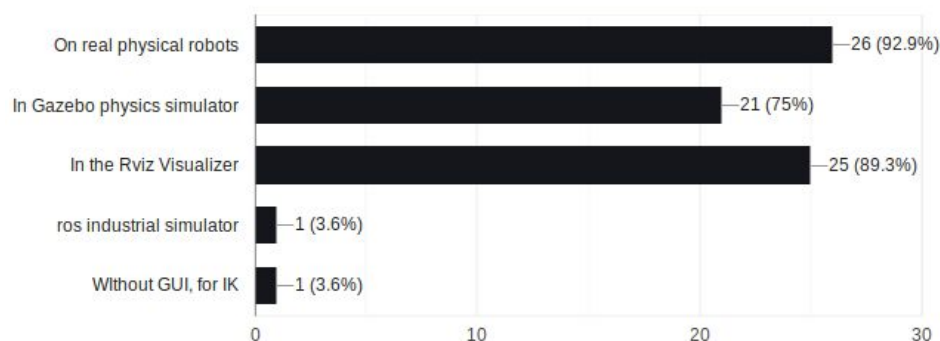
Do you use Movelt?



Yes, I use (or have used) Movelt	28	100%
No, but I am interested in using Movelt	0	0%

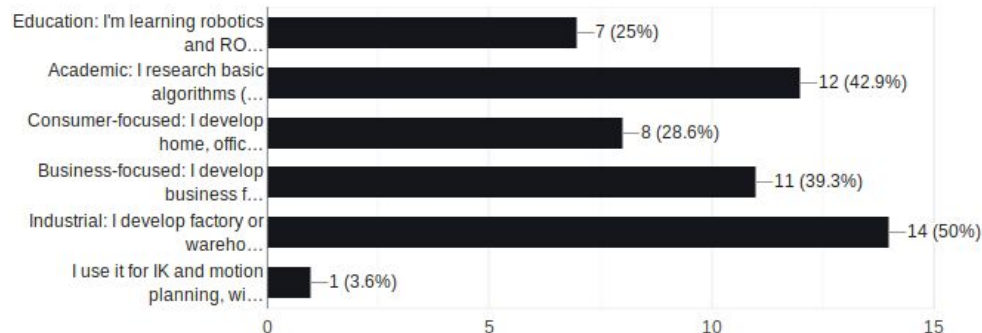
Movelt Usage

Where have you used Movelt?



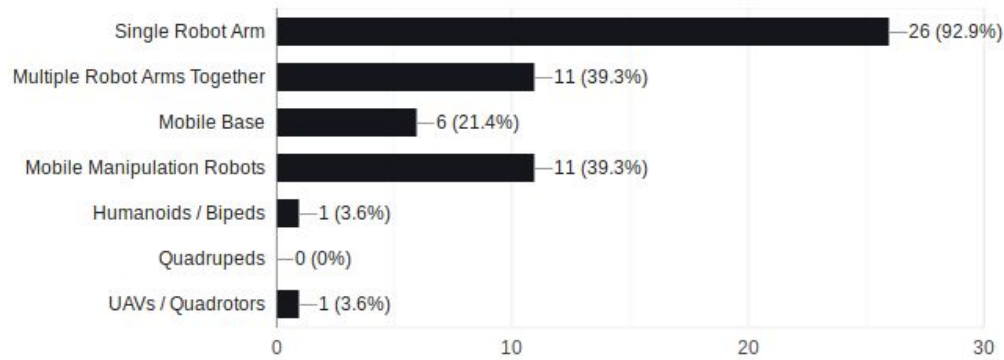
On real physical robots	26	92.9%
In Gazebo physics simulator	21	75%
In the Rviz visualizer	25	89.3%
ROS Industrial simulator	1	3.6%
Without GUI, for IK	1	3.6%

How would you describe your use of Movelt?



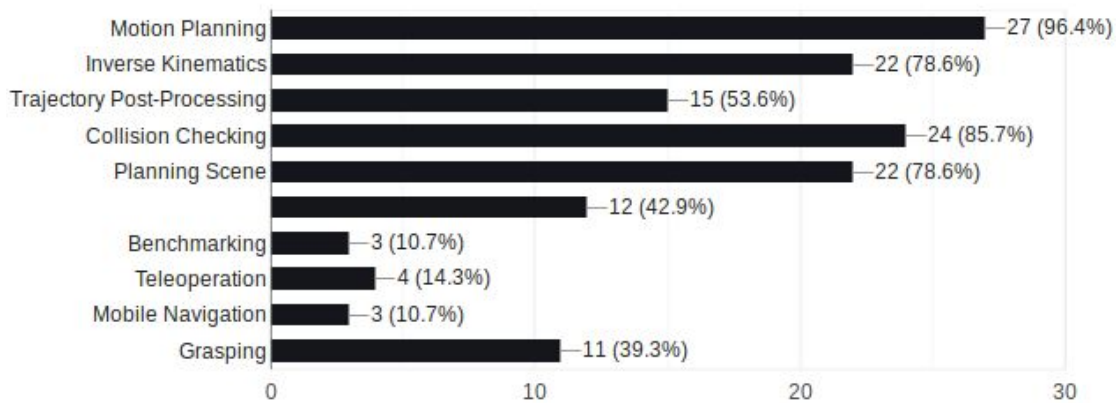
Education: I'm learning robotics and ROS for an education program or hobbyist interest	7	25%
Academic: I research basic algorithms (e.g. motion planning or collision checking)	12	24.9%
Consumer-focused: I develop home, office, or other consumer focused applications for my robot (e.g. cleaning, door opening, etc.)	8	28.6%
Business-focused: I develop business focused robotic applications (e.g. construction robots)	11	39.3%
Industrial: I develop factory or warehouse applications (e.g. painting, assembly, logistics, etc.)	14	50%
(Other) I use it for IK and motion planning, without actually researching these areas.	1	3.6%

What kind of robots are you using MoveIt with?



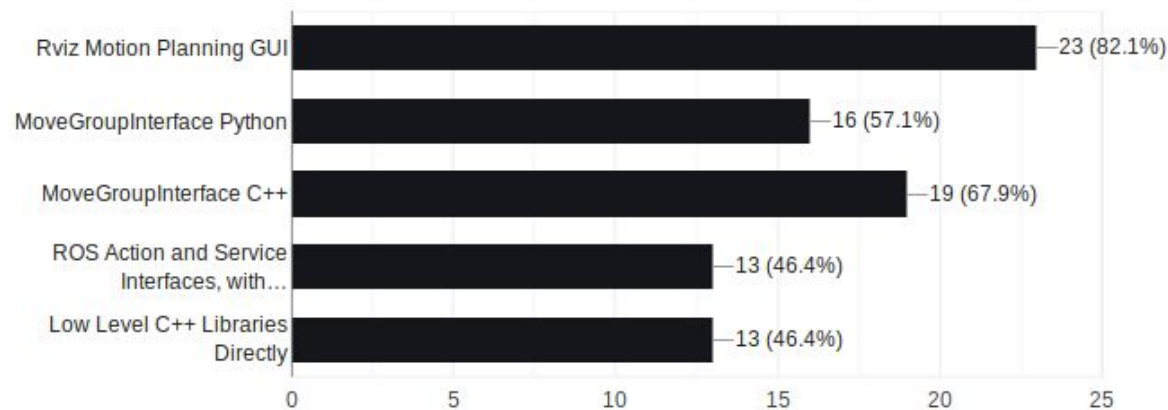
Single Robot Arm	26	92.9%
Multiple Robot Arms Together	11	39.3%
Mobile Base	6	21.4%
Mobile Manipulation Robots	11	39.3%
Humanoids / Bipedes	1	3.6%
Quadrupeds	0	0%
UAVs / Quadcopters	1	3.6%

Which features of MoveIt are you using?



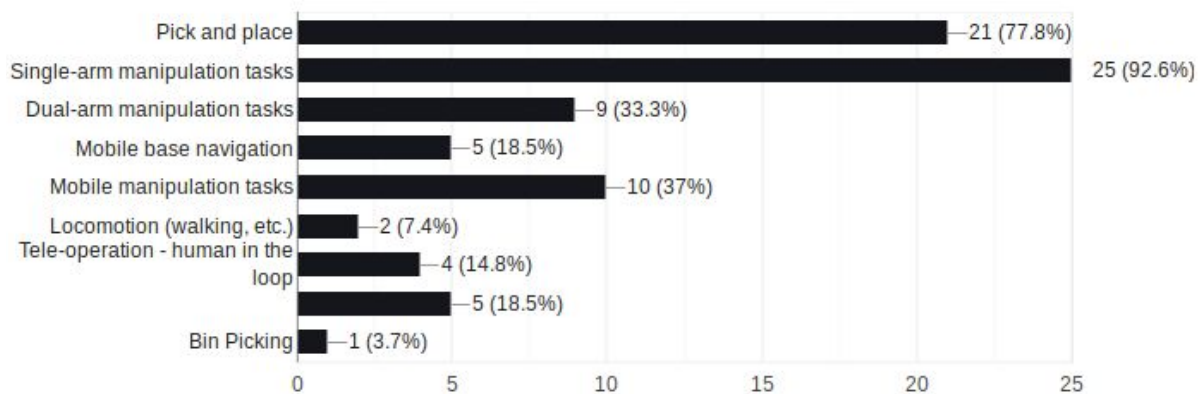
Motion Planning	27	96.4%
Inverse Kinematics	22	78.6%
Trajectory Post-Processing	15	53.6%
Collision Checking	24	85.7%
Planning Scene	22	78.6%
Integrated 3D Perception	12	42.9%
Benchmarking	3	10.7%
Teleoperation	4	14.3%
Mobile Navigation	3	10.7%
Grasping	11	39.3%

Which interface that MoveIt provides are you using?



Rviz Motion Planning GUI	23	82.1%
MoveGroupInterface Python	16	57.1%
MoveGroupInterface C++	19	67.9%
Ros Action and Service interfaces, without MoveGroupInterface	13	46.4%
Low Level C++ Libraries Directly	13	46.4%

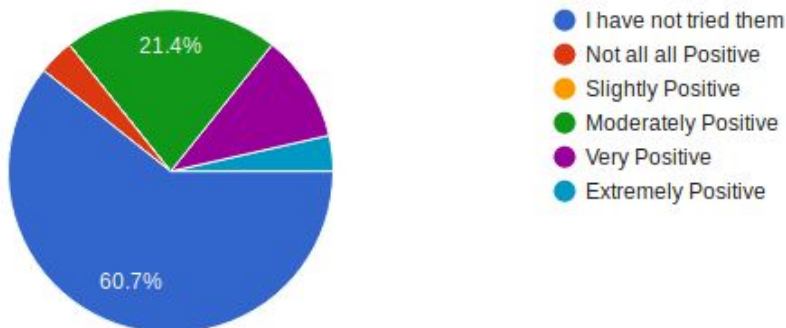
What kind of applications are you using MoveIt for?



Pick and place	21	77.8%
Single-arm manipulation tasks	25	92.6%
Dual-arm manipulation tasks	9	33.3%
Mobile base navigation	5	18.5%
Mobile manipulation tasks	10	37%
Locomotion (walking, etc)	2	7.4%
Tele-operation - human in the loop	4	14.8%
Workspace analysis for robot design	5	18.5%
Bin Picking	1	3.7%

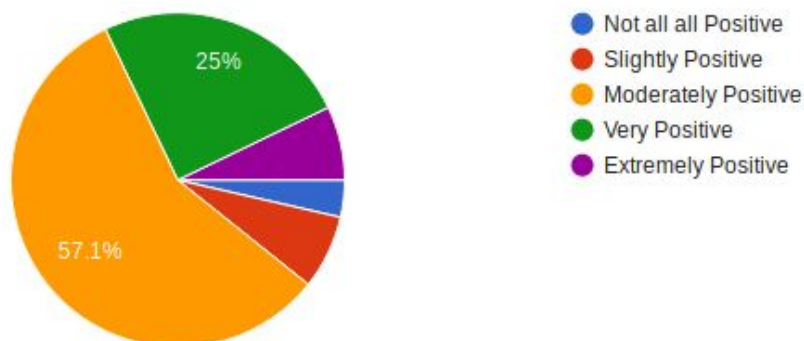
Getting Involved

What was your overall experience with the new Movelt tutorials, using the Franka Emika Panda arm, launched in 2018?



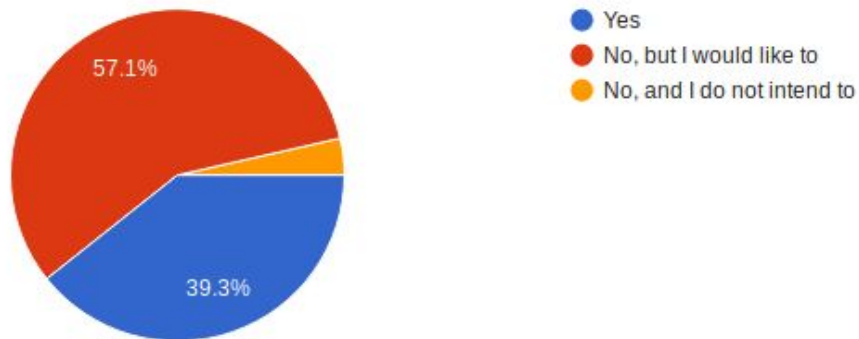
I have not tried them	17	60.7%
Not at all Positive	1	3.6%
Slightly Positive	0	0%
Moderately Positive	6	21.4%
Very Positive	3	10.7%
Extremely Positive	1	3.6%

What was your overall experience with setting up Movelt beyond using the Setup Assistant, such as setting up controllers and sensors?



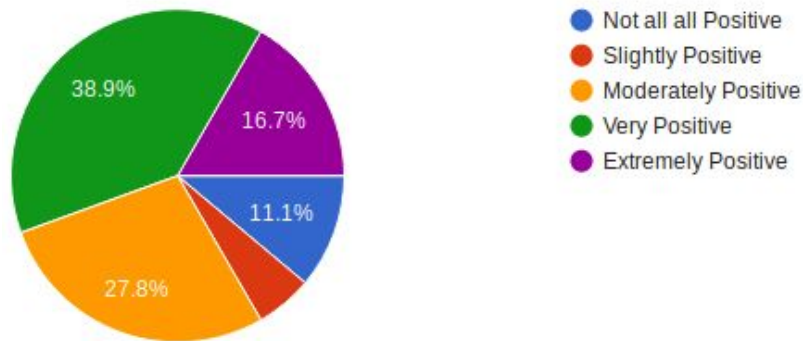
Not at all Positive	1	3.6%
Slightly Positive	2	7.1%
Moderately Positive	16	57.1%
Very Positive	7	25%
Extremely Positive	2	7.1%

Have you tried contributing a pull request to the Movelt project?



Yes	11	39.3%
No, but I would like to	16	57.1%
No, and I do not intend to	1	3.6%

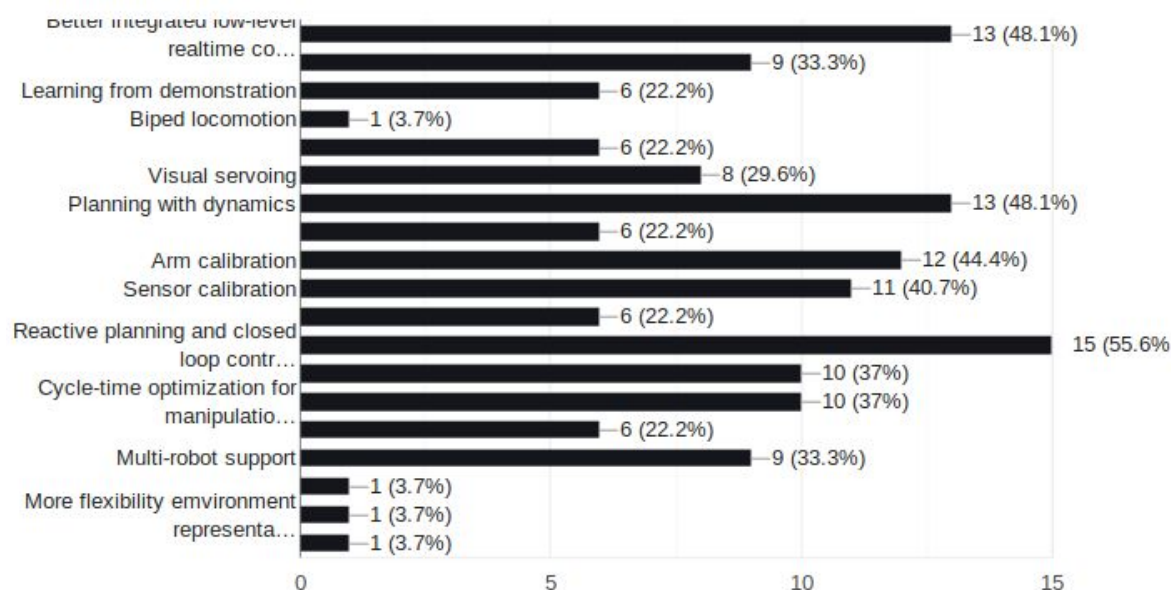
What has been your overall experience in contributing pull requests to the Movelt project?



Not at all Positive	2	11.1%
Slightly Positive	1	5.6%
Moderately Positive	5	27.8%
Very Positive	7	38.9%
Extremely Positive	3	16.7%

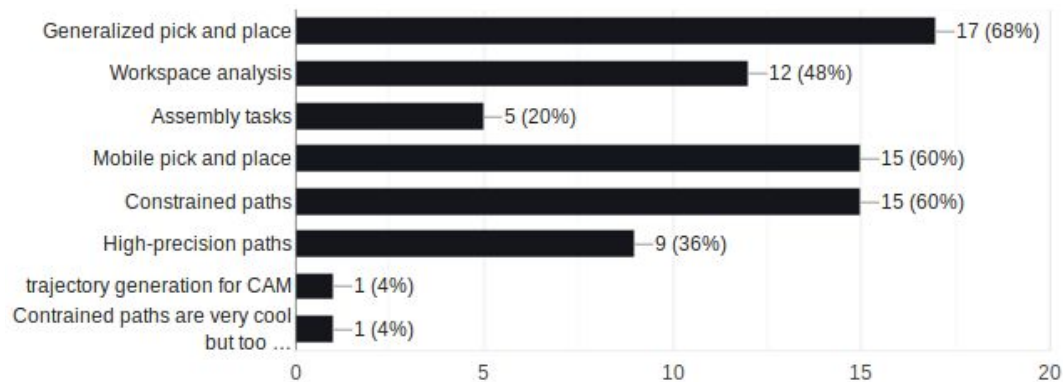
Future Developments

What capabilities would you like to see most in MoveIt?



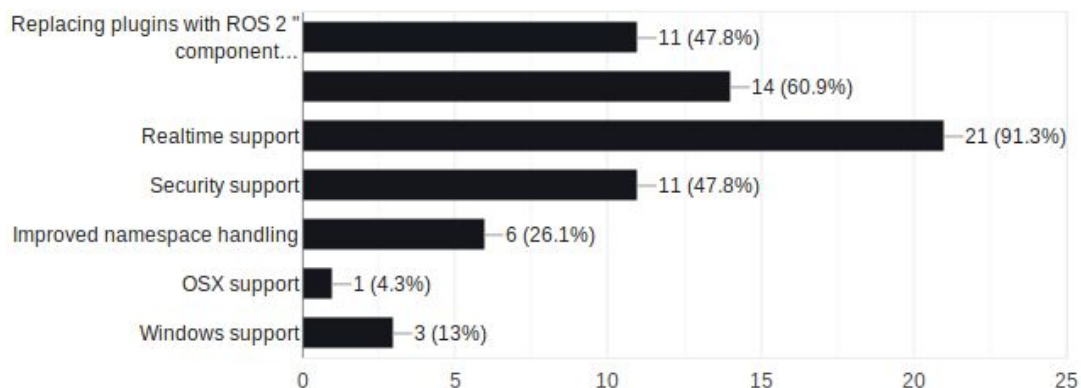
Better integrated low-level realtime controllers (e.g. ros_control)	13	48.1%
Fully integrate the ROS navigation stack	9	33.3%
Learning from demonstration	6	22.2%
Biped locomotion	1	3.7%
Whole-body planning and control	6	22.2%
Visual servoing	8	29.6%
Planning with dynamics	13	48.1%
Better integration with other types of sensing (e.g. proprioceptive, etc.)	6	22.2%
Arm calibration	12	44.4%
Sensor calibration	11	40.7%
Shared autonomy capabilities (e.g. affordance templates)	6	22.2%
Reactive planning and closed loop control	15	55.6%
Collaborative control / human safety	10	37%
Cycle-time optimization for manipulation tasks	10	37%
Tighter Gazebo integration	6	22.2%
Multi-robot support	9	33.3%
Other	3	3.7%

What kinds of integrated applications would you like to see improved or added in MoveIt?



Generalized pick and place	17	68%
Workspace analysis	12	48%
Assembly tasks	5	20%
Mobile pick and place	15	60%
Constrained paths	15	50%
high -precision paths	9	36%
Other	2	8%

What are you most excited about in MoveIt for ROS 2.0 (e.g. MoveIt 2.0)?



Replacing plugins with ROS 2 "component nodes" (multiple ROS nodes in same process with zero memory copy)	17	47.8%
Lifecycle management of the ROS nodes	14	60.9%
Realtime support	21	91.3%
Security support	11	47.8%
Improved namespace handling	6	26.1%
OSX support	1	4.3%
Windows support	3	13%

Please add any additional suggestions or feedback for the MoveIt team.

Thanks for making and sharing such an amazing tool set!!

All of the suggested capabilities sound good, it's hard to pick any favorites!

You/We rock!

Great work, I think MoveIt is still the only great graphical manipulation interface that allows to operate a robot and IK easily

Thank you everyone for this awesome project! <3

Thank you for your amazing work!

Robots Using MoveIt

This is a compiled list of robot types that have used or are using MoveIt. This data is compiled based from several different surveys past and present. Many of these robots have more than one distinct users. In addition many custom robots created by users are not mentioned here.

Total Number of Different Robots: 126

ABB IRB 120
ABB IRB 1200
ABB IRB 120t
ABB IRB 1600
ABB IRB 2400
ABB IRB 2600
ABB IRB 4400
ABB IRB 4600
ABB IRB 52
ABB IRB 5400
ABB IRB 6600
ABB IRB 6640
ABB IRB 6650
ABB IRB 7600
ABB IRB 14000
Active8 Robots AR10 Robotic Hand
Acutronic MARA
Aldebaran NAO
Aldebaran Romeo
Aubo Cobot
Barrett WAM
Barrett Hand
Bionic Robotics BioRob Arm
Boston Dynamics Atlas
CENTRE FOR RESEARCH AND TECHNOLOGY HELLAS Clopema Robot
Comau NM45
Cyton Veta
Denso Robot (vs060)
DLR Hit Hand
[e.DO](#)
Eindhoven University of Technology AMIGO
Fanuc irimate200ib
Fanuc irimate200ib3l
Fanuc irimate200ic

Fanuc irimate200ic5h
Fanuc irimate200ic5l
Fanuc m-430ia
Fanuc m-430ia/2f
Fanuc m-430ia/2p
Fanuc m-6ib
Fanuc m10ia
Fanuc m16ib
Fanuc m16ib20
Fanuc m20ia
Fanuc m20ia/10l
Fanuc m20ib25
Fetch Robotics Fetch
Franka Emika Panda
Fraunhofer IPA Care-O-Bot
Fraunhofer IPA Rob@Work
Fujitsu HOAP-3
Han's Robot Elfin
HDT Arm
IIT iCub
Kaist Hubo
Kawada Hiro
Kawada HRP-4
Kawada HRP-2
Kinova Jaco
Kinova Jaco2
Kinova Movo
Kinova Mico
Korus Homemate Robot
KUKA IIWA
KUKA KR 10
KUKA KR 150
KUKA KR 16
KUKA KR 210
KUKA KR 3
KUKA KR 5
KUKA KR 6
KUKA KR 16
KUKA KR 22
KUKA KR 120
KUKA LBR
KUKA LWR
KUKA OmniROB

KUKA Youbot
Lynxmotion Servo Erector Arm
MEKA M3
Mitsubishi RV4FLM
Mitsubishi RV2F
ModLab (Penn) CKBot
Motoman bmda3
Motoman epx series
Motoman MH12
Motoman MH50
Motoman MH5
Motoman MPL80
Motoman SIA10D
Motoman SIA20
Motoman SIA5D
NASA Johnson Space Center Robonaut
NASA Johnson Space Center Robonaut 2
NASA Johnson Space Center Valkyrie
Neuronics Katana
PAL Robotics REEM
PAL Robotics REEM-C
PAL Robotics TIAGo
PILZ PRBT
Pioneer P3AT
Rethink Robotics Baxter Research Robot
Rethink Robotics Sawyer
ROBOTIS BIOLOID
Robotnik X-WAM
Robotnik JR2
Robotnik XL-Terabot
RT CRANE-X7
RT CRANE+
RT Sciurus17
Schunk 7-DOF
Schunk Dextrous Hand
Schunk Powerball
Scorbot ER4U
Seed RH series
Shadow Robotics Arm and Hand
Staubli rx160
Staubli SCARA
Trossen Robotics PhantomX Pincher
TUM Rosie

Unbounded Robotics UBR-1

Universal Robots UR10

Universal Robots UR3

Universal Robots UR5

Willow Garage PR2

Youbot HOLLIE