

The Robot-Era Domestic Robot: Kinova Jaco and Movelt!

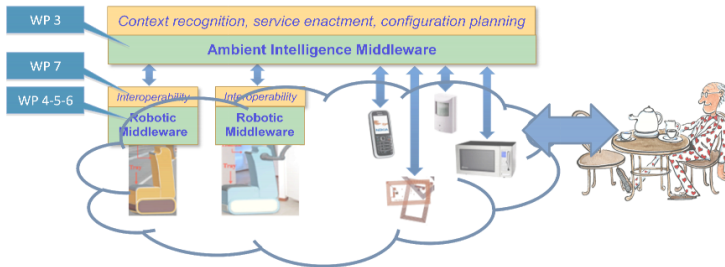
Movelt! tutorial, ICRA-2013

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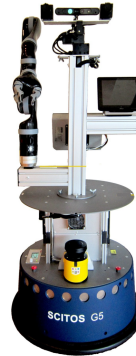
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Robot-Era: Service Robots for Elderly Care

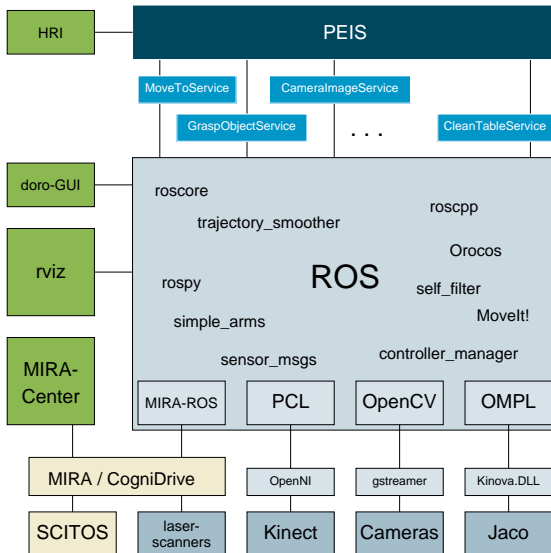


- ▶ three robots: outdoor, condominium, domestic
- ▶ PEIS ambient sensor network, tablet + speech HRI
- ▶ EU-FP7 project, 12 partners, 48 months
- ▶ ROS for robot-control, manipulation, simulation

Domestic Robot: manipulation services



- ▶ differential-drive platform, sensor-head
- ▶ one Kinova Jaco arm with gripper
- ▶ prototypes about 70K EUR



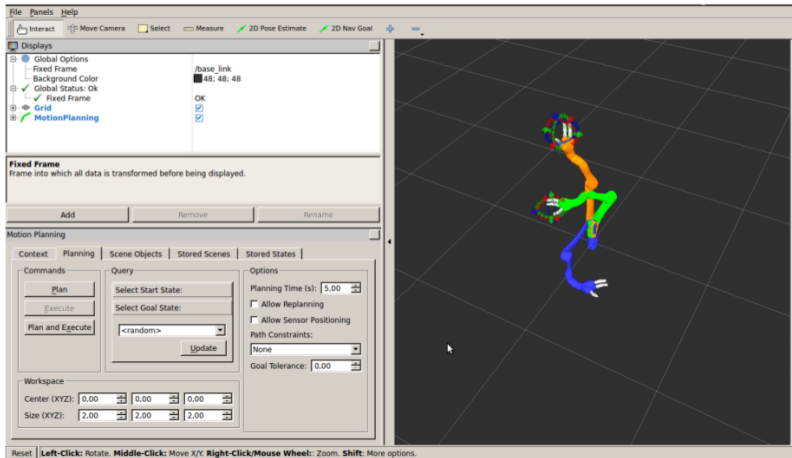
Doro manipulator: Jaco arm

designed by Kinova Canada:

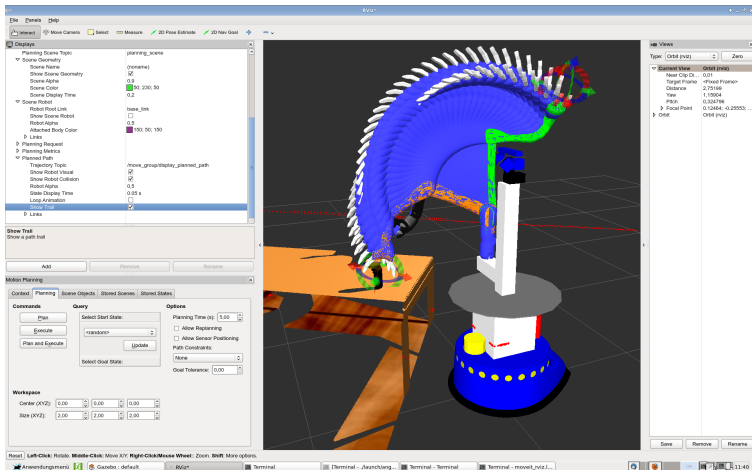
- ▶ rehabilitation + wheelchair use
- ▶ very good joystick control
- ▶ useful 3-finger gripper
- ▶ slow but safe (no brakes!)
- ▶ payload 1.5 kg, total weight 5 kg
- ▶ 6-DOF, 1 m reach
- ▶ unusual kinematics
- ▶ Windows .NET software
- ▶ basic ROS node, but no robust IK



MoveIt! standalone Jaco arm



MoveIt! works out of the box



Movelt! status and future work

- ▶ setup is really easy, assistant works fine
- ▶ trajectory planning and generation works
- ▶ trajectory replay on Jaco works
- ▶ missing Kinova IK not a problem anymore
- ▶ self-collision model not perfect
- ▶ OMPL/RRT fast enough
- ▶ mixing Fuerte (Gazebo) and Groovy (Movelt) ok
- ▶ working on the gripper now

Discussion

- ▶ Thanks for your attention!
- ▶ Questions?
 - ▶ www.robot-era.eu/
 - ▶ hendrich@informatik.uni-hamburg.de
- ▶ ROS incredibly useful
- ▶ MoveIt! very promising
- ▶ Acknowledgments: funding by project Robot-Era, FP7-288999