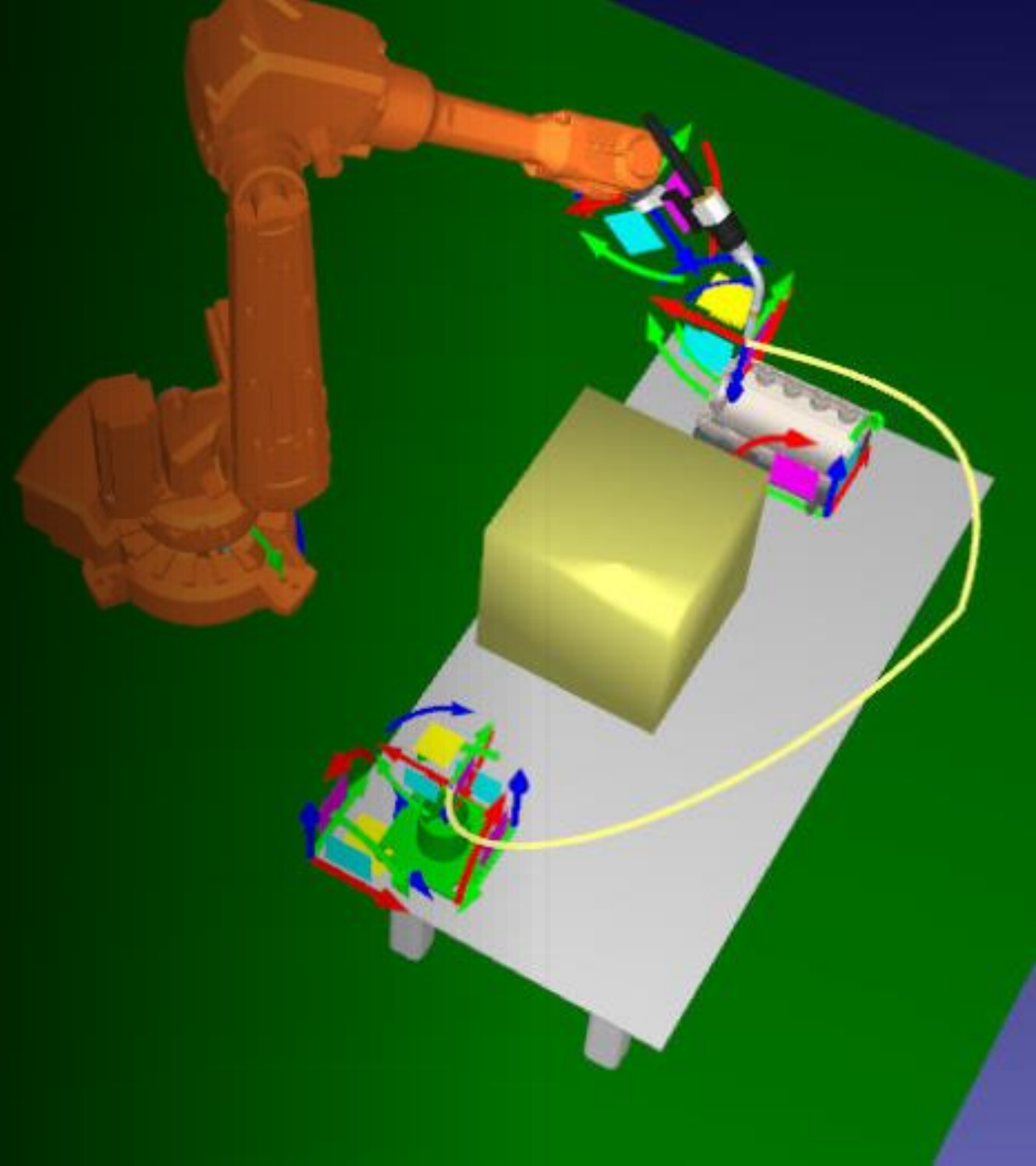
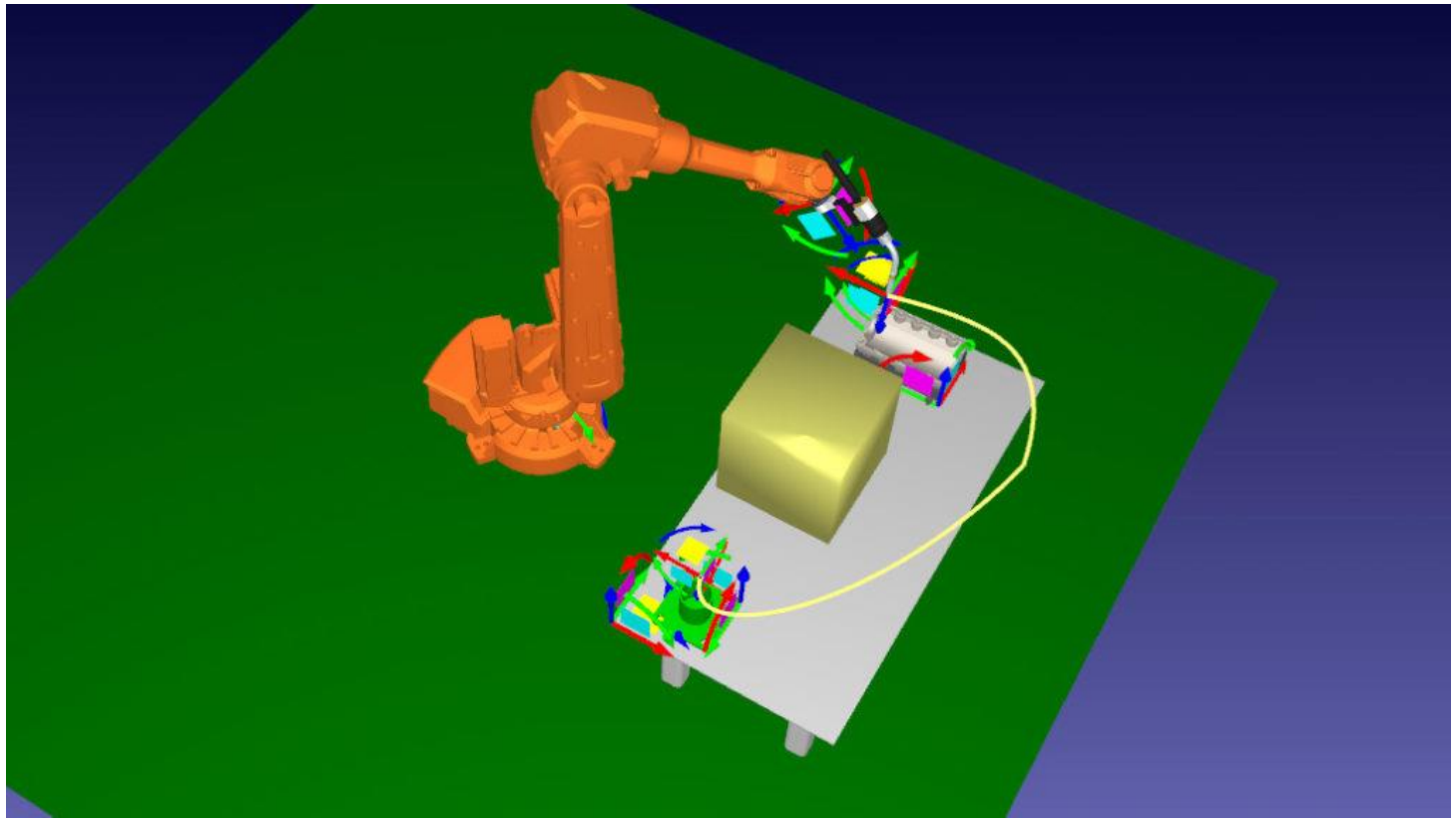
Robot Arm Project: Motion Planning

Sitong Chen



What does it do?

- Move the arm from initial pose to a target pose.
- given the current location and a target, how should the arm move to reach that target?



How to do it?

- We will be using MoveIt – a motion planning framework.

moveit

noetic *Show EOL distros:* ☐

See moveit on index.ros.org for more info including aything ROS 2 related.

Documentation Status

moveit: *moveit_commander* | *moveit_core* | *moveit_planners* | *moveit_plugins* | *moveit_ros* | *moveit_setup_assistant*

Package Links
FAQ
Changelog
Change List
Reviews

Dependencies (7)
Jenkins jobs (5)

Package Summary

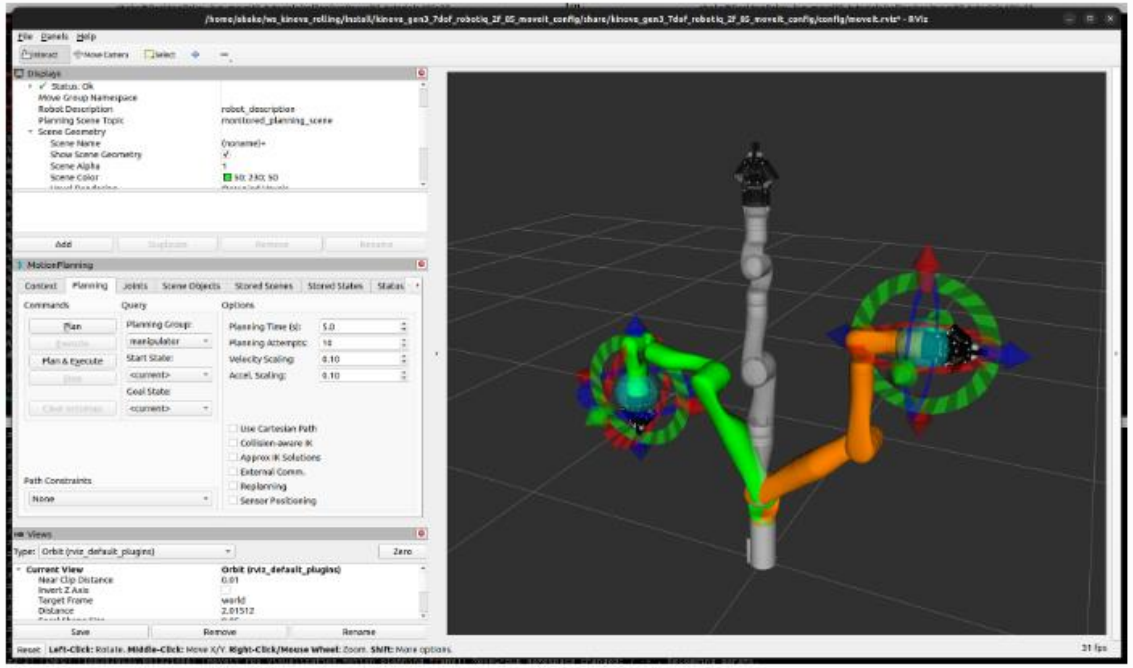
✔ Released ✔ Documented

Meta package that contains all essential package of MoveIt. Until Summer 2016 MoveIt had been developed over multiple repositories, where developers' usability and maintenance effort was non-trivial. See the detailed discussion for the merge of several repositories.

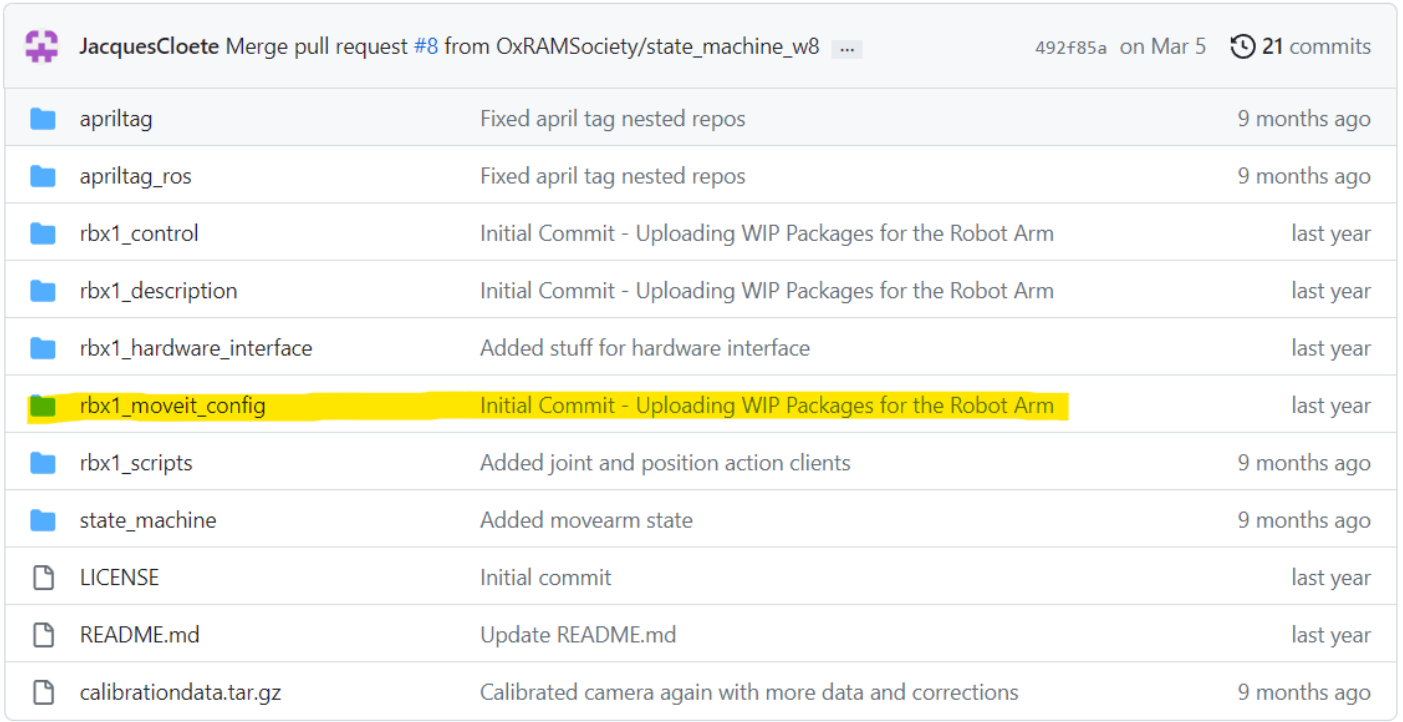
- Maintainer status: maintained
- Maintainer: Dave Coleman <dave AT picknik DOT ai>, Michael Ferguson <mferguson AT fetchrobotics DOT com>, Michael Görner <me AT v4hn DOT de>, Robert Haschke <rhaschke AT techfak.uni-bielefeld DOT de>, Ian McMahon <imcmahon01 AT gmail DOT com>, Isaac I. Y. Saito <130s AT 2000.jukuin.keio.ac DOT jp>
- Author: Ioan Sucan <isucan AT google DOT com>, Sachin Chitta <robot.moveit AT gmail DOT com>
- License: BSD
- External website: http://moveit.ros.org
- Bug / feature tracker: https://github.com/ros-planning/moveit/issues
- Source: git https://github.com/ros-planning/moveit.git (branch: noetic-devel)

All documentation for MoveIt is on the MoveIt website.

MoveIt Quickstart in RViz



- We can load the model of the arm.
- Some action server to control it.



JacquesCloete Merge pull request #8 from OxRAMSociety/state_machine_w8 ... 492f85a on Mar 5 21 commits

apriltag	Fixed april tag nested repos	9 months ago
apriltag_ros	Fixed april tag nested repos	9 months ago
rbx1_control	Initial Commit - Uploading WIP Packages for the Robot Arm	last year
rbx1_description	Initial Commit - Uploading WIP Packages for the Robot Arm	last year
rbx1_hardware_interface	Added stuff for hardware interface	last year
rbx1_moveit_config	Initial Commit - Uploading WIP Packages for the Robot Arm	last year
rbx1_scripts	Added joint and position action clients	9 months ago
state_machine	Added movearm state	9 months ago
LICENSE	Initial commit	last year
README.md	Update README.md	last year
calibrationdata.tar.gz	Calibrated camera again with more data and corrections	9 months ago

Things we do

- **Motion Planning API**: Utilize MoveIt's Motion Planning API within your ROS nodes to create custom motion planning applications.
- **Planning and Execution**: Write ROS nodes that use MoveIt's planning capabilities to create plans for your robot arm. Once a plan is generated, you can execute it using MoveIt's execution interface, which interfaces with your robot's controllers.
- **RViz**: Use RViz, a 3D visualization tool for ROS, to visualize your robot's movements and the planned trajectories before executing them on the actual hardware.
- **Simulation**: Test your robot's motion plans using a simulator like Gazebo to ensure they are safe and effective.
- **Real Robot Execution**: Once you're satisfied with the simulated results, you can execute the motion plans on the actual robot arm, monitoring its performance and making any necessary adjustments.