

Industrial Trajectory Generation for MoveIt!



https://wiki.ros.org/pilz_robots

ROS-Industrial Conference
Stuttgart, 11 December 2018

► FTP Industrial Trajectory Generation for MoveIt!

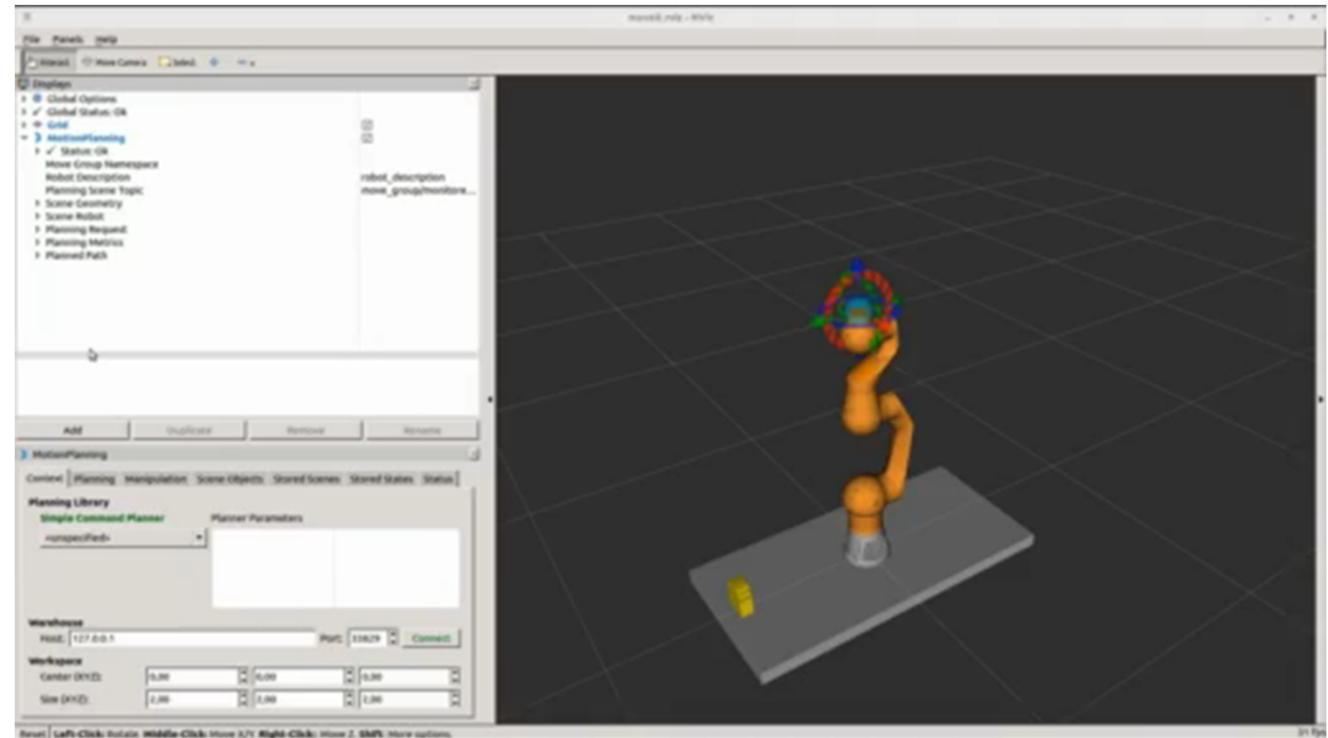


► FTP Industrial Trajectory Generation for MoveIt!

Goal:

- ▶ Reproducible trajectories
(PTP, LIN, CIRC)
- ▶ Fast computation
- ▶ Easy-to-use interface
 - ▶ Motion from RViz
 - ▶ Programming with Python API
 - ▶ Tutorials

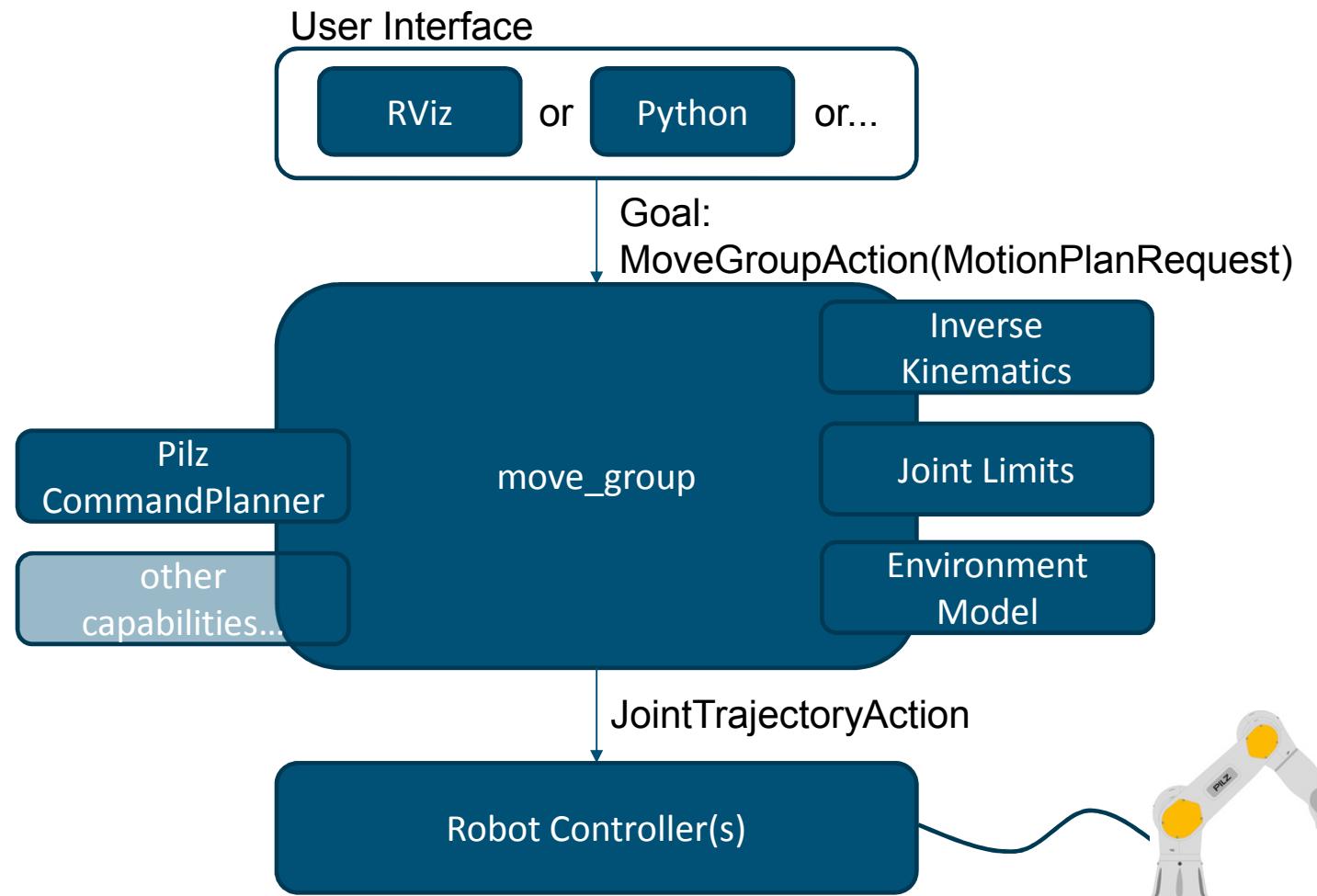
Working for every robot
which has a moveit_config.



Strength of

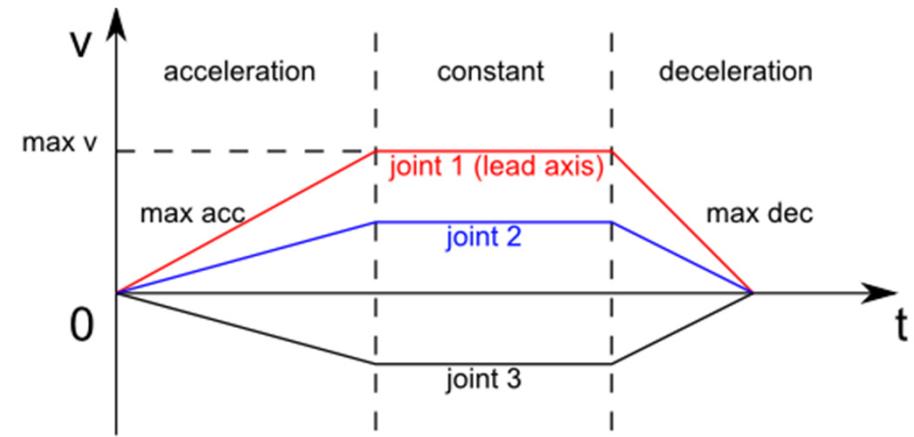
The framework combines

- ▶ Kinematics module(s)
- ▶ Collision checking with the environment model
- ▶ Trajectory execution

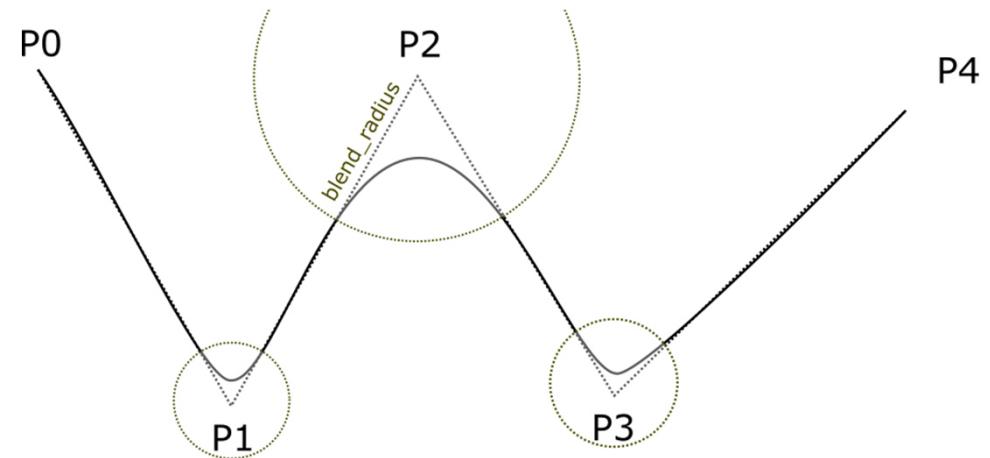


► Pilz CommandPlanner

► Trapezoidal velocity profiles



► Blend combines a sequence of commands: e.g. LIN-LIN



► User-Interface: Python-API

- ▶ Easy-to-use
- ▶ Pause/Continue Services
- ▶ Reference frames to move relative to arbitrary Tf

```
# init a rosnode
rospy.init_node('robot_program_node')

# instance of the robot
r = Robot(__REQUIRED_API_VERSION__)

rospy.loginfo("Pick PNOZ from machine") # log
r.move(Ptp(goal=Pose(position=pos_work_station,
                      orientation=orientation_work_station),
        vel_scale = __ROBOT_VELOCITY__,
        relative=False))
r.move(Lin(goal=Pose(position=Point(0, 0, 0.1)),
           reference_frame="prbt_tcp",
           vel_scale=0.2))
```

► With a focus on quality

Documentation

- Overview on wiki.ros.org/pilz_robots
- Tutorials
- API-Documentation

ROS.org

About | Support | Discussion Forum | Service Status | Q&A answers.ros.org

Documentation Browse Software News

pilz_robots

kinetic melodic

Documentation Status

pilz_robots: [prbt_lkfast_manipulator_plugin](#) | [prbt_moveit_config](#) | [prbt_support](#)

Package Summary

✓ Released ✓ Continuous Integration: 6 / 6 ✓ Documented

The metapackage

- Maintainer status: developed
- Maintainer: Pilz GmbH and Co. KG <ros AT pilz DOT de>

Package Links

Tutorials
FAQ
Changelog
Change List
Reviews

Dependencies (4)

Jenkins jobs (9)

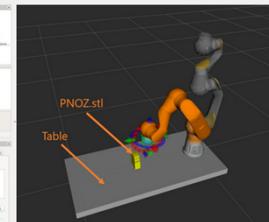
ROS.org

About | Support | Discussion Forum | Service Status | Q&A answers.ros.org

Search: Submit

Documentation Browse Software News Download

[pilz_robots/ Tutorials/ ModelYourApplicationWithPRBT](#)



2. Prerequisites

In order to complete this tutorial, you need:

- A workstation or a Virtual machine (VM) with Linux Ubuntu 16.04 LTS and ROS kinetic installed

Tutorials

Tests

- Unit- and Integration tests (Travis-CI-Integration)
- ~100% code coverage

coverage

100%



All checks have passed

1 successful check

✓  [continuous-integration/travis-ci](#)

► Experiences with ROSIN and ROS-I consortium

Overall:

- ▶ Good mentoring and fast feedback
- ▶ Direct connections to the maintainers (e.g. World-Movel-Day)
- ▶ Helpful community

To be improved:

- ▶ Are some core packages unmaintained?
- ▶ Versioning of packages and release cycles



► So we can offer our customers

- Extendable, modular robotics components

Check it out: wiki.ros.org/pilz_robots



Automation
technology

COMPONENTS
SYSTEMS
SERVICES

Innovative
Safe

Ecological
Economical

Joachim Schleicher

Pilz GmbH & Co. KG
Felix-Wankel-Straße 2
73760 Ostfildern, Germany
Tel.: +49 711 3409-7209
j.schleicher@pilz.de



Keep up-to-date on Pilz
www.pilz.com

PILZ
THE SPIRIT OF SAFETY

CMSE® InduracNET p®, PAS4000® PAScan® PASconfig®, Pilz®, PIT®, PLD®, PMConfig®, PMCprime®, PMConfigdo®, PMS®, PMI®, PMI®, PMOZ®, Pilmo®, PSEN®, PSSE®, PVIS®, SafetyBUS p®, SafetyEYE®, SafetyNET p®, THE SPIRIT OF SAFETY®, features may vary from the details stated in this document, depending on the status at the time of publication and the scope of the equipment. We accept no responsibility for the validity, accuracy and entirety of the text and graphics presented in this information. Please contact our Technical Support if you have any questions.