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ROSCon 2017 / Vancouver
About Myself

Since 2016 PhD student at Hamburg University, Group TAMS

Since 2007 maintainer with the Linux Distribution Lunar-Linux

Since 2013 involved with ROS-enabled hardware including PR2, UR, Shadow Hands

Joined MoveIt Maintainers in 2016 after using it for two years
User Experiences

The Good

Yes, of course we use MoveIt!
It works great for our purposes.

The Bad

Yeah, we tried MoveIt..
We didn’t get it to work [sufficiently well].
Now we roll our own code.

The In-Between

Well, we use it for some things.
For others we had to use other projects.
On Stability

No program which depends on broken behavior deserves protection. If a programmer has found such a discrepancy and changed the application to use it instead of reporting it to the library maintainer s/he gets what s/he deserves.

It's not as simple when your code decides controls for costly robots

Stability is essential

Correct implementations too

We added SONAMEs for library versioning

indigo is stable

kinetic will stay API compatible

lunar is still released from kinetic-devel
On Stability

Ulrich Drepper, 2002

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- Stability is essential
- Correct implementations too
- We added SONAMEs for library versioning

- indigo is stable
- kinetic will stay API compatible
- lunar is still released from kinetic-devel
The Last Two Years

The Commit History

- Merged code into a central repository
- Closed 379 pull-requests
- Fixed many bugs
- Added many small features to the main project
- New 2017 Video Montage
Upgrade to Current Release for

- Numerous bug fixes
- Visual Collision Matrix in Setup Assistant
- Synchronous Planning Scene Updates
- Start State Validation for Execution Action
- Interactive Trajectory Display
- Minimum-distance solutions in ikfast plugin
- Alternative Time Parametrization
- ...
MoveIt by Example

Where to go from here

▶ Choose Joint State Targets
▶ Add Padding
▶ Reduce Joint Limits
▶ Configure different OMPL planners
...
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Upgrade with STOMP

http://wiki.ros.org/industrial_moveit
Upgrade with Descartes

http://wiki.ros.org/descartes
Upgrade Grasping

- Grasping is the most frequent request but no solved problem
- MoveIt supports your solutions in your scenario
- Universal and affordance grasping requires perception models

- Some projects provide grasps you can “feed” to MoveIt

https://github.com/davetcoleman/moveit_simple_grasps
https://www2.ccs.neu.edu/research/helpinghands/code.html
https://github.com/TAMS-Group/moveit_gpd_pick_object
Upgrade Visualization

MoveIt Visual Tools

https://github.com/ros-planning/moveit_visual_tools

Reuleaux

https://github.com/ros-industrial-consortium/reuleaux
BiolK - A kinematics base plugin

- New Inverse Kinematics Plugin
- Master Thesis by Philipp Ruppel at TAMS
- Based on Genetic Algorithms & Particle Swarm Optimization

- Efficient parallelized implementation
- Improves on TracIK in success rate and performance
- Allows for intuitive approximate solutions
- Handle multiple goals (including secondary objectives)
- Better generic support for ≠6DOF
BioIK

Various Goal Types

- Position
- Orientation
- Pose
- LookAt
- JointVariable
- CenterJoints
- MinimumDisplacement
- KeepContact
- BalanceCenterOfMass
- AvoidJointLimits
- (Min|Max)Distance
- Lambda

Available at

https://github.com/TAMS-Group/bio_ik

Official release coming soon
Save The Date!

World MoveIt! Day 2017

- Takes place at **October 18th**
- Event Locations at
  - Verb Surgical, San Francisco Bay Area
  - Magazino, Munich, Germany
  - Shadow Robot, London, UK
  - SwRI, San Antonio
  - ...

Join The Event!
Upgrade Movelt!

Upgrade Your Experience
   Check current releases

Upgrade Your Possibilities
   Consider third-party components

Upgrade Movelt!
   Contribute working time and/or useful modules

Movelt is a default for robotic manipulation in ROS.
   Please help us move forward!
Questions?

Many Thanks to
All original authors - All maintainers
Everyone who contributed time & effort
Philipp Ruppel - Norman Hendrich
Henning Kayser - Benjamin Scholz