

Getting started Manual InMoov ROS Project

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Introduction:

This Project includes three major pieces of software. The intended operating system is Ubuntu 16.04 LTS newer versions probably work just fine but 16.04 is the official version ROS Kinetic Kame is supported on. We chose a slightly different version Kubuntu 16.04 LTS . . Also we use the version of MoveIt matching to ROS Kinetic Kame which needs to be installed for the simulation and motion planning involved.

Kubuntu 16.04 LTS

Installation

The current setup runs on Kubuntu 16.04 LTS as it is the primary target for ROS Kinetic. Kubuntu needs to be installed first here are some manuals to do this.

-Installation Manual (en):

<https://userbase.kde.org/index.php?title=Kubuntu/Installation&oldid=356826>

-Installation Manual (de):

https://wiki.ubuntuusers.de/Kubuntu_Installation/

ROS Kinetic Kame

Installation

The InMoov ROS Project currently runs on ROS Kinetic Kame which comes with very good documentation and an installation manual. <http://wiki.ros.org/kinetic/Installation/Ubuntu>

Getting Started

ROS is a elegant system for controlling robots but it has various mechanisms and ideas which need to be understood in order to efficiently use it. Therefore it is a good idea to play around with some or all of the tutorials at this point. <http://wiki.ros.org/ROS/Tutorials>

MoveIt

Installation

Motion Planning, Collision checking and Simulation is done using MoveIt we need to install this after ROS. Make sure you chose the correct version corresponding to ROS Kinetic Kame <http://moveit.ros.org/install/>

Getting Started

MoveIt also Provides some good Tutorials which can be found here: http://docs.ros.org/kinetic/api/moveit_tutorials/html/index.html

InMoov

Installation of some packages needed for InMoov

After Installing Kubuntu and ROS it is necessary to install a few extra packages which might not be included in the main installation. Here is a command to do just this.

```
sudo apt-get install arduino dkms qt5-default qtcreator clang-format-3.8 ros-kinetic-rqt ros-kinetic-rqt-common-plugins ros-kinetic-rosserial-arduino ros-kinetic-rosserial ros-kinetic-xarco ros-kinetic-opencv3 ros-kinetic-cv-bridge ros-kinetic-compressed-depth-image-transport ros-kinetic-compressed-image-transport ros-kinetic-usb-cam ros-kinetic-pyros ros-kinetic-trac_ik liburdfdom-tools python-wstool python-catkin-tools python-pip
```

Next Step we need to install a Python Package:

```
sudo pip install qdarkstyle
```

Setup

The first step is to setup a new catkin workspace.

<http://wiki.ros.org/ROS/Tutorials/InstallingandConfiguringROSEnvironment>

After completing this copy the xenial_kinetic branch of InMoov ROS packages into the src folder you just created. These packages can be found here:

https://github.com/TheOnlyRoxion/inmoov_ros/tree/xenial_kinetic

The Next step is to navigate in a Terminal to your catkin workspace and run the Commands „catkin_make“ to build all packages and „. devel/setup.bash“ to let ROS know about all of your new ROS packages.

To check if everything went smoothly run the following commands in Terminal:

- start roscore = `roscore`
- open a new Terminal and run = `roslaunch inmoov_description demo.launch`

Now RViz and a Joint_state_publisher UI should start.

After everything is started you should be able to use Joint_state_publisher to move the robot.

MoveIt

The Model used for Simulation in the InMoov packages should be properly setup.

Should the need arise to modify InMoov's model inmoov_description contains those folders. The movit folder contains the setup_assistant. You can launch this in Terminal using “roslaunch inmoov_description setup_assistant.launch” which also comes with a handy Tutorial.

http://docs.ros.org/kinetic/api/moveit_tutorials/html/doc/setup_assistant/setup_assistant_tutorial.html

For some changes e.g. joint limits or kinematics it might be more useful to change those values directly in the corresponding file. You can find those under /inmoov_description/moveit/config .

Arduino

In order to use Arduino we need to setup a few things Start at 2.2.

[http://wiki.ros.org/roscpp/arduino/Tutorials/Arduino IDE Setup](http://wiki.ros.org/roscpp/arduino/Tutorials/Arduino%20IDE%20Setup)

Msg Srv

If changing or adding new messages or services, add them to Arduino libraries follow this manual.

[http://wiki.ros.org/roscpp/Tutorials/Adding Other Messages](http://wiki.ros.org/roscpp/Tutorials/Adding%20Other%20Messages)

Further useful links