Open Source Robotics Foundation

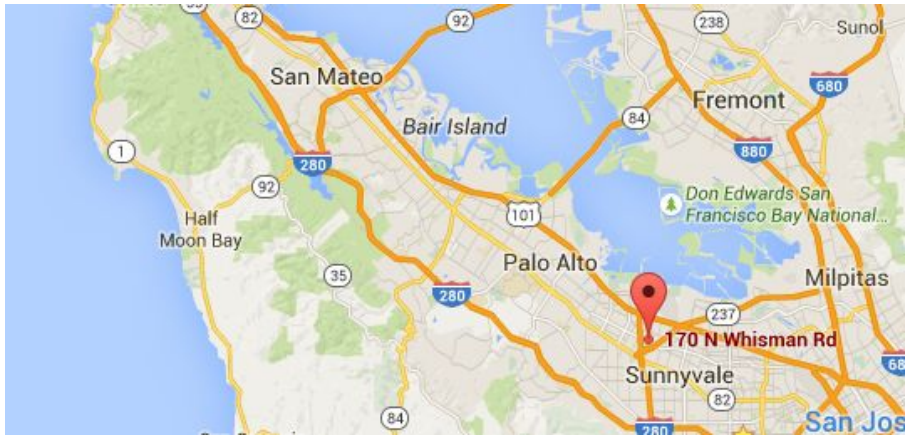
And The Robotics Fast Track

Hugo Boyer

Open Source Robotics Foundation

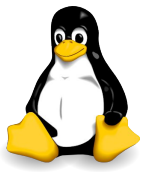
"...to support the development, distribution, and adoption of open source software for use in robotics research, education, and product development."

http://osrfoundation.org

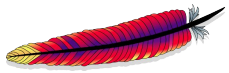


The Goal: (Open-Source) Rapid-Prototyping

web



MySQL



python

robotics

ROS

GAZEBO

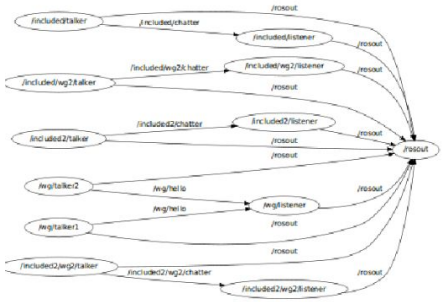
OpenCV

pcl

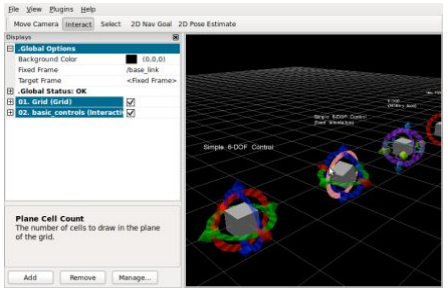
CloudSim

MoveIt!

ROS is...



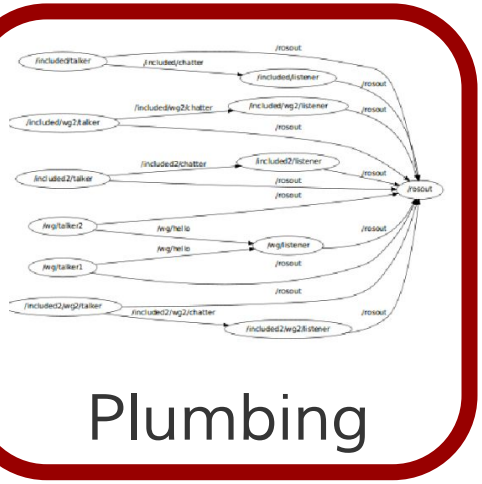
Plumbing



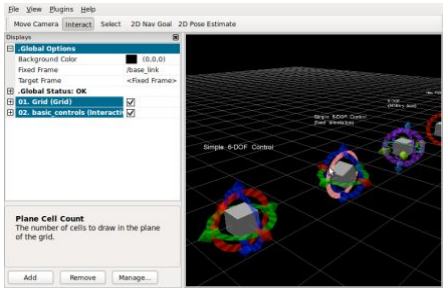
Tools

Ecosystem

ROS is...



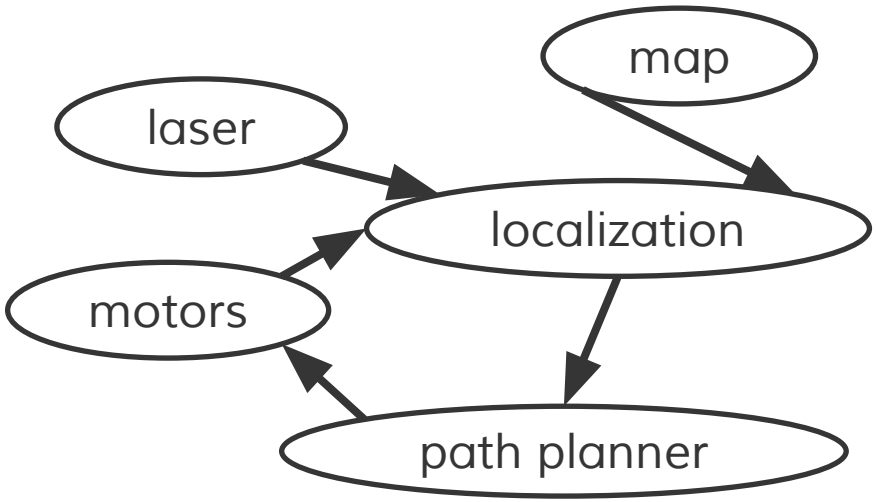
Plumbing



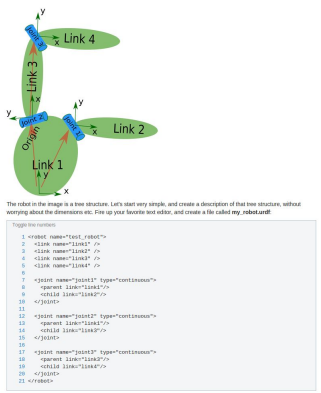
Tools

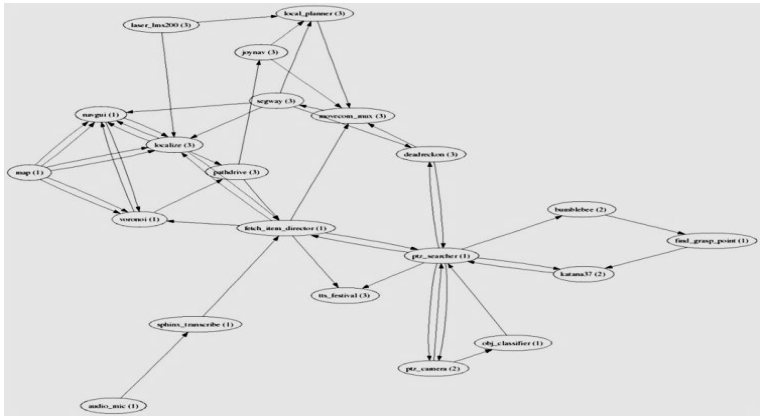
Ecosystem

ROS Plumbing



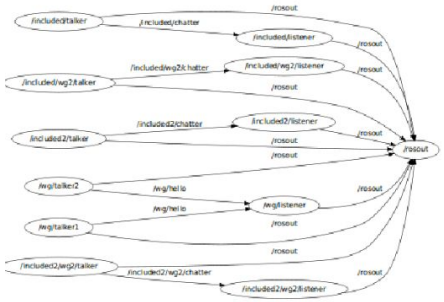
bubbles = separate POSIX processes
start / stop / restart / crash / debug independently



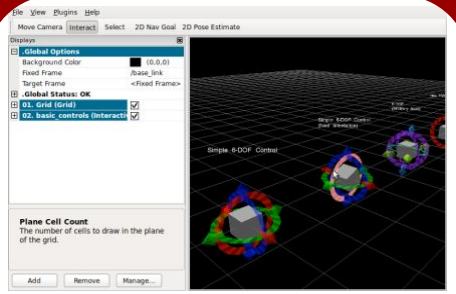


PR2: 56 processes, 540 topics

ROS is...



Plumbing



Tools

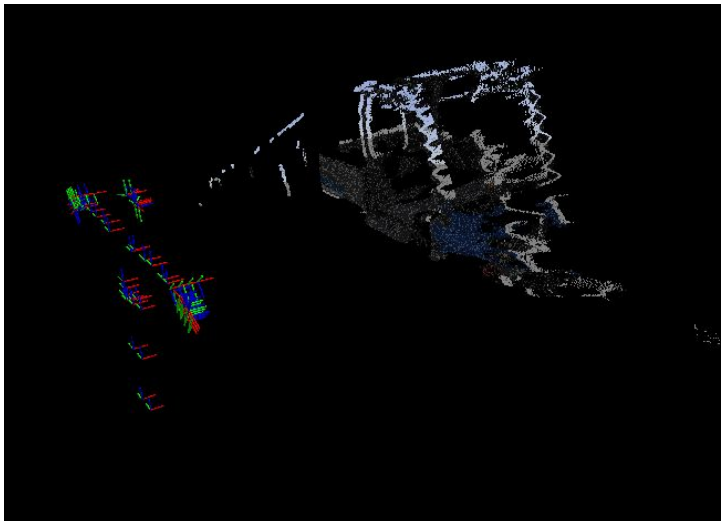
Ecosystem

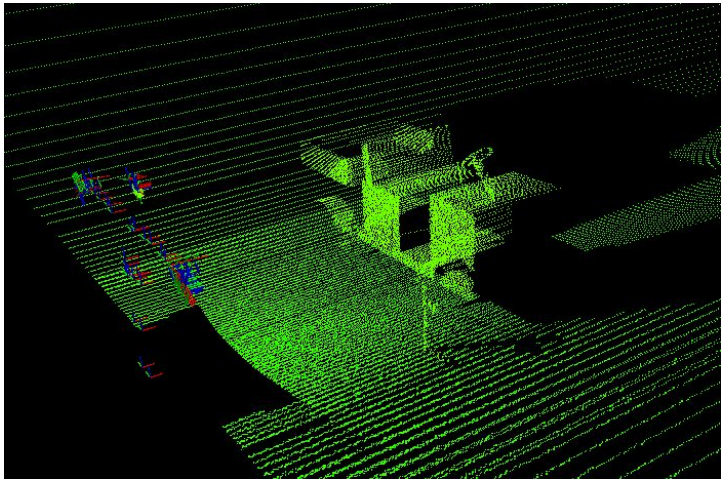
ROS Tools: Hardware Drivers

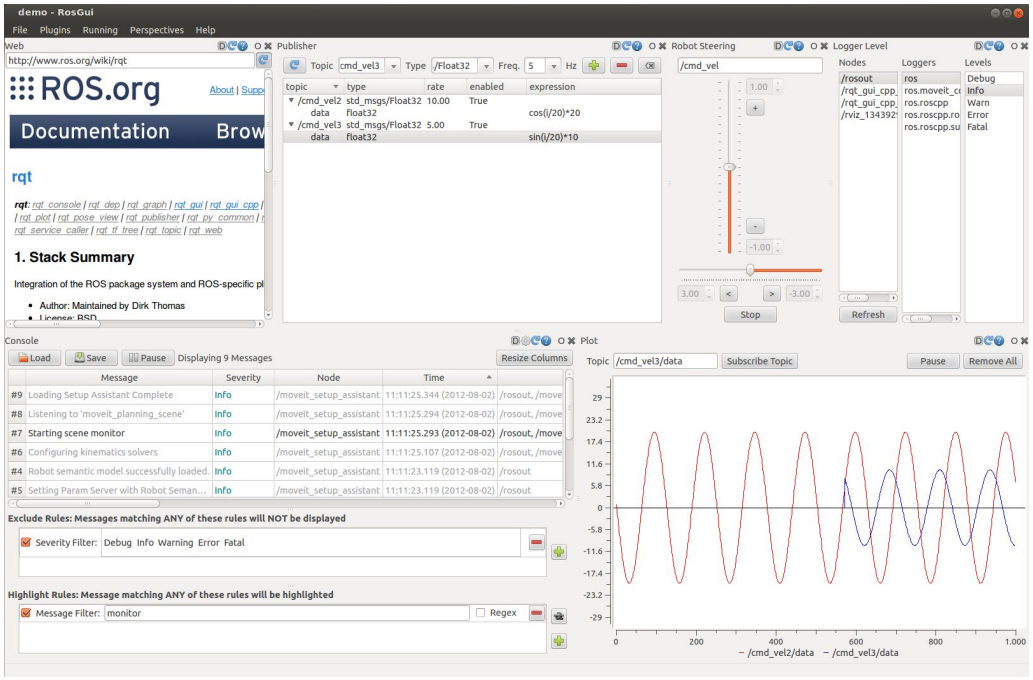
- cameras
- depth cameras
- laser scanners
- robots
- audio
- inertial units
- GPS
- joysticks
- motors ...

ROS Tools: Visualization

- Qt- and plugin-based
- plot common data types
- live 3D visualizations



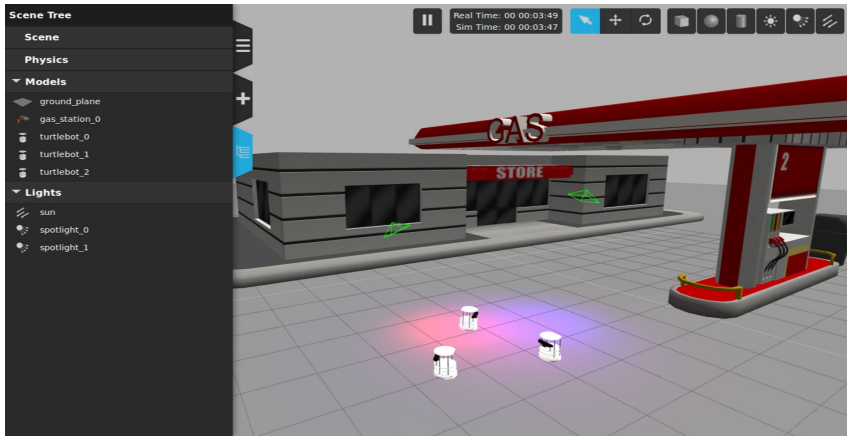


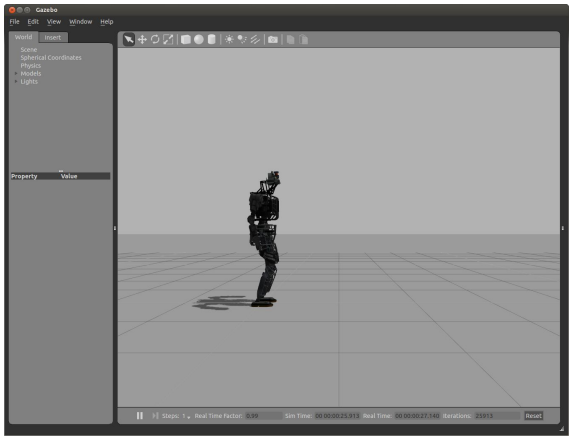


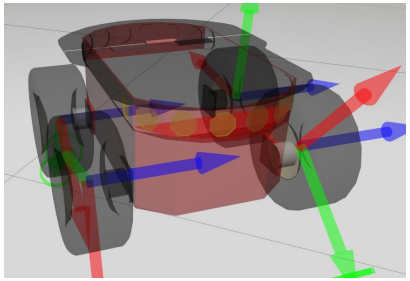
ROS Tools

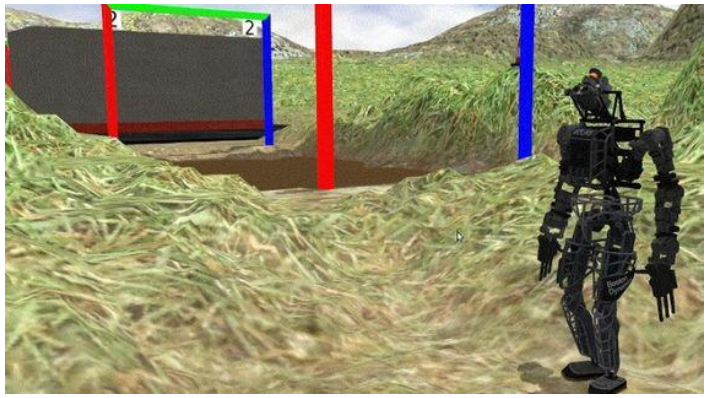
High level
mapping planning and perception

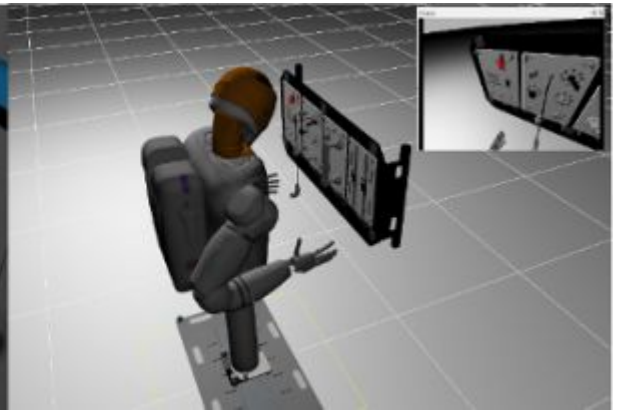
ROS Tools: Gazebo Simulator











GAZEBO

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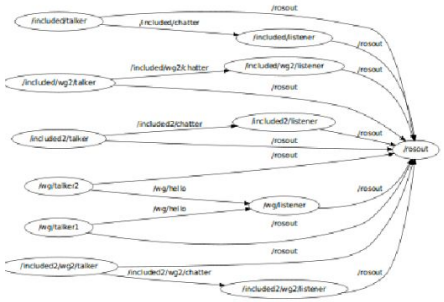
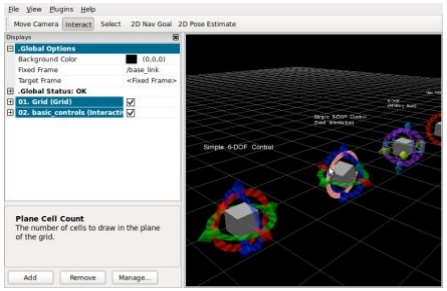
ROS is...



Plumbing



Tools

Ecosystem

ROS Ecosystem: Variety

Big





Small







Industrial





Vehicles



Air/Water

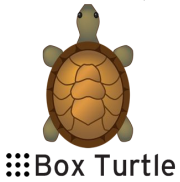




ROS distributions

distribution = stable target for applications

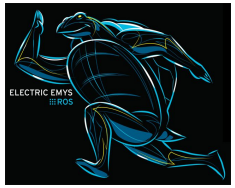
2010



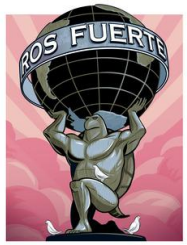
2010

2010

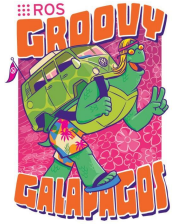
2011



2011



2012



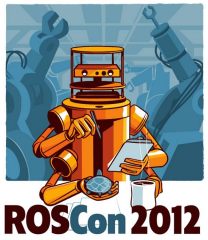
2012

2013

2014

2015

Community: ROSCon



ROSCon October 3-4, 2015
Hamburg, Germany

Brought to you by:

Open Source Robotics Foundation

Platinum Sponsors

ubuntu

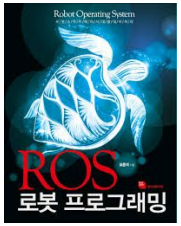
fetch robotics

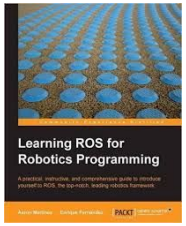
Learning

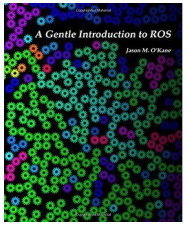
ROS is made with:
- Ubuntu
- C++ CMake
- Python

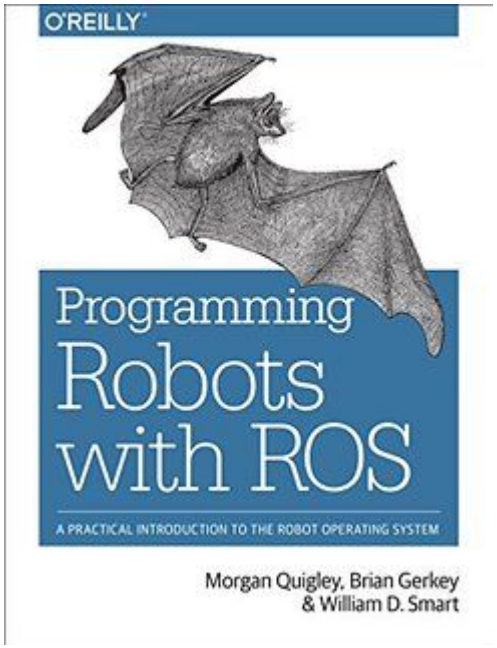
http://wiki.ros.org
http://answers.ros.org (stack exchange like)

http://gazebosim.org/
http://gazebosim.org/tutorials
http://answers.gazebosim.org









Open Hardware (electronics)

Make available our work to the public

https://bitbucket.org/osrf/sandia-hand

FPGA based motor control
Computer vision
Data distribution and Networking

No “products”

Robotics Fast Track

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Robotics Fast Track

1. Multi-year, non-equity financing program
2. Average $150 000 and 9 months
3. You must grant Government Purpose Rights to DARPA
4. Keep the Intellectual Property

Robotics Fast Track: Goals

1. Drive innovation in robotics. Do new stuff that we couldn't do before. Develop new technology.
2. Enable rapid, cost-effective development of new robotics capabilities
3. Achieve breakthrough capabilities in less time and at a fraction of the cost typical of government-supported robotic development processes
4. Proposals in all areas of robotics are welcome (hardware, software, everything in between, all domains).

Robotics Fast Track

1. Almost everybody is eligible to propose: small companies, individuals, universities. Non traditional proposers.
2. Domestic and foreign (with some limitations).
3. Proposal and contract overhead is low (short proposals, quick turnaround on awards, simple contracts, minimal reporting).

Robotics Fast Track: Evaluation

1. Overall Scientific and Technical Merit
2. Relevance to the DARPA Mission: revolutionary technology, high-payoff research
3. Cost Realism: the proposed costs are realistic for the technical and management approach offered.

Robotics Fast Track: Evaluation

My suggestions

1. Follow the template
2. Describe what problem are you solving (with numbers).
3. Describe how your solution going to improve the current situation.
4. Innovation must be focused on robotics (not in another area, and simply demonstrated using robots).
5. You will need an awesome demo
6. You will need novelty / science: engineering or integration is not enough.
7. 150k over 9 months?
8. Send us your questions by email, submit more than once.

Robotics Fast Track: Awards

Awards

1. Oregon State University - Direct 3D Printing of Silicone Elastomer to Make Soft Robots
2. Inverse Limit - A method of Far-field 3D-scanning
3. Oregon State University - Dragline-enabled Mobile Robots (SpiderBots)
4. Atredis Partners – SecLK

Questions

http://www.osrfoundation.org
https://rft.osrfoundation.org