Laboratory and Skills — Robot Operating System

Ivan Marković   Matko Orsag   Damjan Miklić
(Srećko Jurić-Kavelj)

University of Zagreb, Faculty of Electrical Engineering and Computing,
Departement of Control and Computer Engineering

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University of Zagreb
Faculty of Electrical Engineering
and Computing

About this course

- Bootstrap to ROS in 6 lectures (no prerequisites)
  - Introduction to GNU/Linux
  - Introduction to Python
  - Introduction to ROS
  - ROS programing
  - Linux programming topics
  - ROS navigation stack
- Individual/group assignments for the rest of the semester
- Course webpage `http://www.fer.unizg.hr/predmet/pzros`
- Instructors can be reached at {`ivan.markovic`, `matko.orsag`,`damjan.miklic`}`@fer.hr`.

What is ROS?

From http://www.ros.org/wiki/ROS/Introduction:
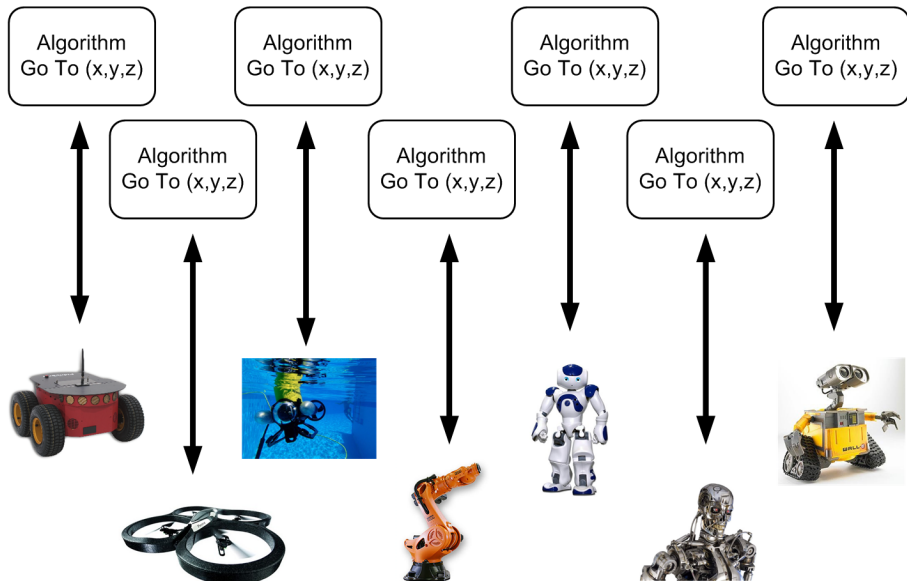
- open-source, meta-operating system for your robot
  - hardware abstraction
  - low-level device control
  - message-passing between processes
  - implementation of commonly-used functionality
  - package management
- primary goal is to enable code reuse in robotics research and development
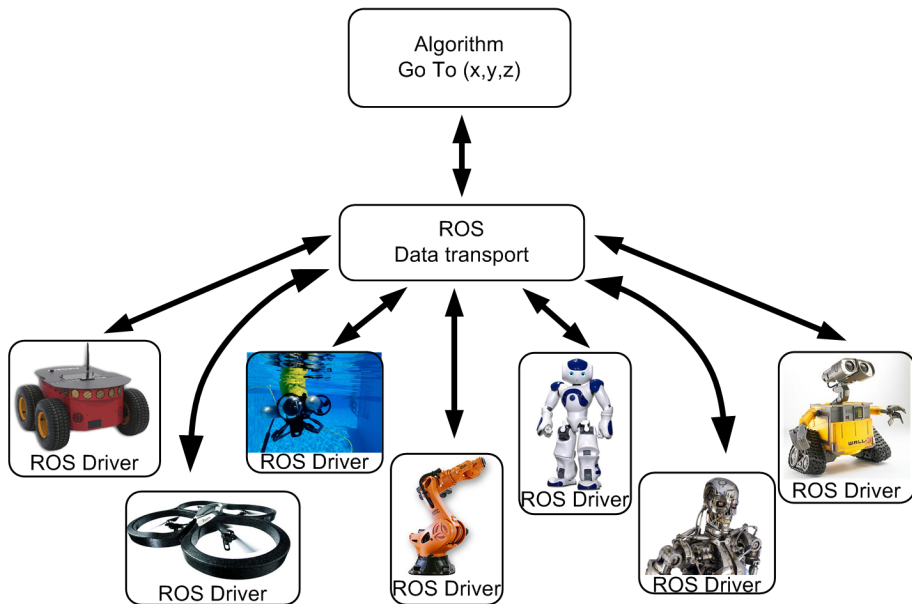- ROS community

What is ROS (in pictures)?

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Why do we need it?

- well defined and stable interfaces (hardware)
- many *driver* packages for all kinds of hardware
- lots of high level functionality implemented
- code reuse, no need to reinvent the wheel
- established and efficient work flow
- community

Examples

- Robots for Humanity by Willow Garage, Georgia Tech Healthcare Robotics Lab
- PR2 plays pool by Willow Garage
- Quadrotor SLAM by SwarmLab, Maastricht University
- RGBD SLAM by Autonomous Intelligent Systems Lab, University of Freiburg
- Nao climbing stairs by Humanoid Robots Lab, University of Freiburg

Homework:

- Check out the Web about the ROS and the Ubuntu project
- If you want, install Linux Ubuntu 14.04 LTS on your laptop (recommended installation size: $>=$ 5GB, Linux Installfest) and ROS Indigo
- Otherwise, you can work on the computers in the Faculty laboratories
- In order to pass the course you have to turn in all homework assignments and attain at least 50% of points from each, and 50% of points for the final assignment

Useful links

- `http://www.ros.org/wiki/` (starting point)
- `http://answers.ros.org/questions/` (gamified Q&A community)
- `http://www.willowgarage.com/` (ROS founders)
- `http://www.osrfoundation.org` (ROS maintainers)