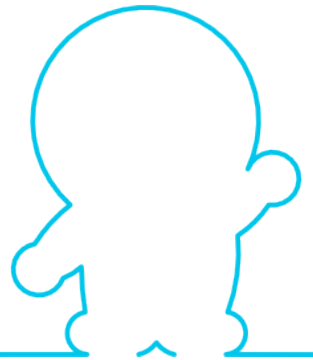
ROS for Fast Prototyping

Where ROS Truly Helps Industry

张浩 Hao Zhang
蓝胖子机器人 Dorabot Inc
Hao@Dorabot.com



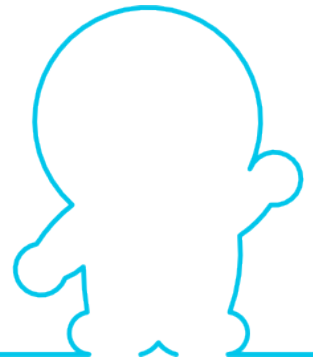
Foreword

- If you are not already familiar with ROS, what I'm about to say might be confusing.
- However, that's my personal experience with ROS in the past 5 years. So pay attention, it will save your ass.
- There's only one slide you should iron in your mind. I'll ask you again which one is it.

Once upon a time...

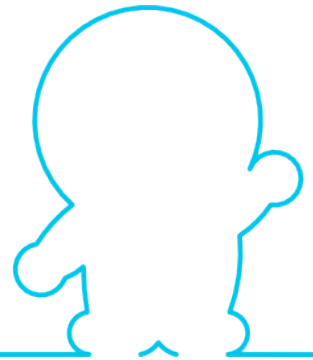
What's good about ROS

- Easy communication
- Ready-to-use packages
- Extensibility
- Updates fast, major release every year.



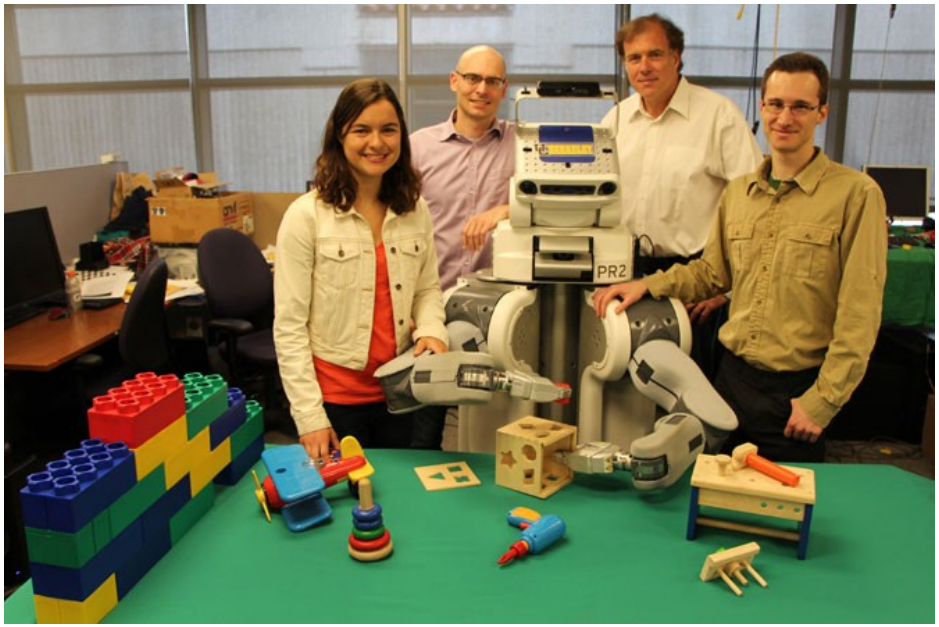
What's bad about ROS

- Disastrous version control
- Unstable
- Packages just won't work out of the box
- Updates too fast, major release every year.

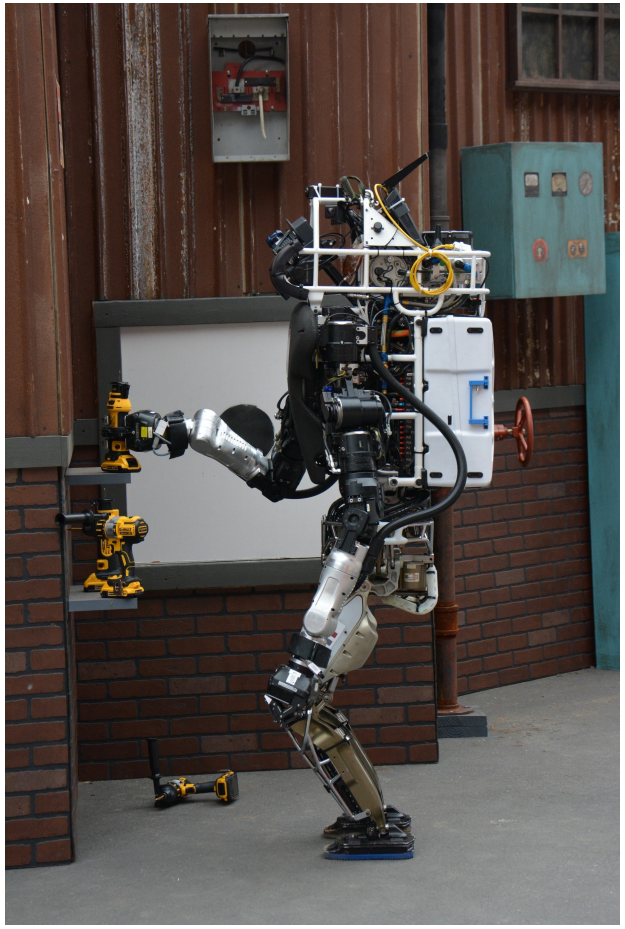


Golden scenario: use ROS in research

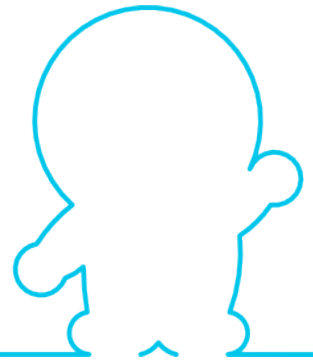
- Use packages to save the need for “re-inventing the wheels”
- Just take the wheel, go ahead and try to build a car



Silver scenario: use ROS in competition



Commercial Application?



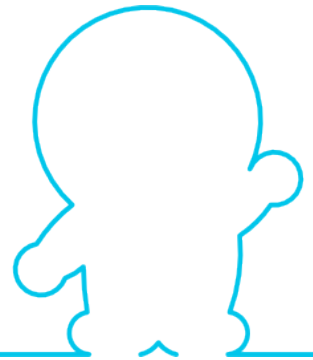
- DO NOT USE ROS IN YOUR FINAL PRODUCT
- DO NOT USE ROS IN YOUR FINAL PRODUCT
- DO NOT USE ROS IN YOUR FINAL PRODUCT

It's important so I'll say it 3 times.

Unless, your product is designed for research or competition.

ROS is like Makeblock

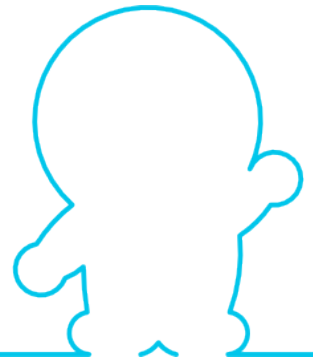
- You can and probably should use Makeblock to test out your idea.
- You'll never use Makeblock to build an actual product and sell it.
- Use various packages and easy communication to build a proof of concept.
- Deliver your product with your own software.



Ex1. Gesture controlled claw machine

Ex1. Gesture controlled claw machine

- OpenNI/freenect gets Skeleton
- Rosserial Communicates to Arduino
- Arduino Overrides joystick (Yes you definitely needs knowledge more than ROS to do anything interesting outside the virtual world)

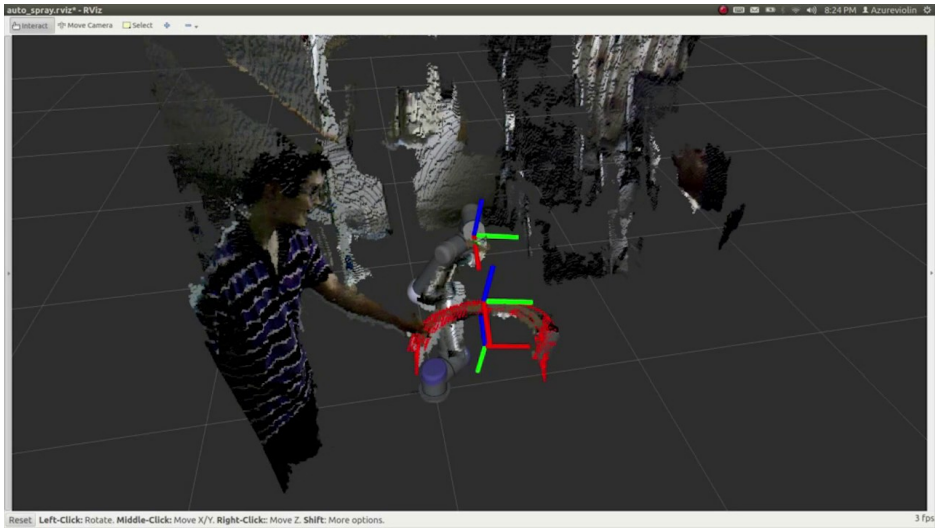


Ex2. DORA Opensource Robot Assistant

Ex2. DORA Opensource Robot Assistant

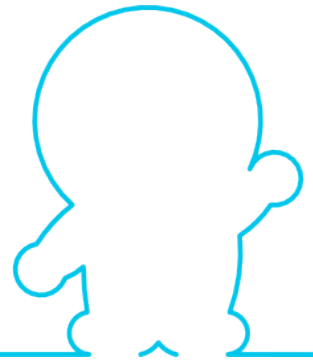
- OpenNI for Kinect Driver
- Rosserial for communicating to multiple Arduino
- V4l to stream video
- OpenCV to recognize face
- Arm-navigation to move arm
- Own Implementation Inverse Kinematics/KDL
- Navigation

Ex3. Dynamic Workpiece Tracker

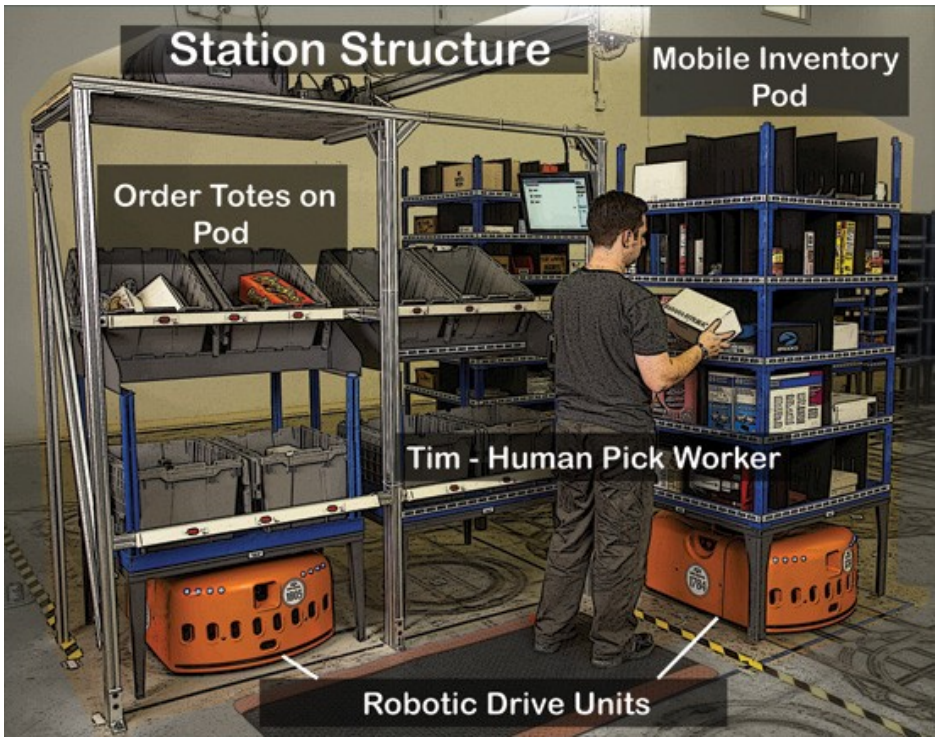


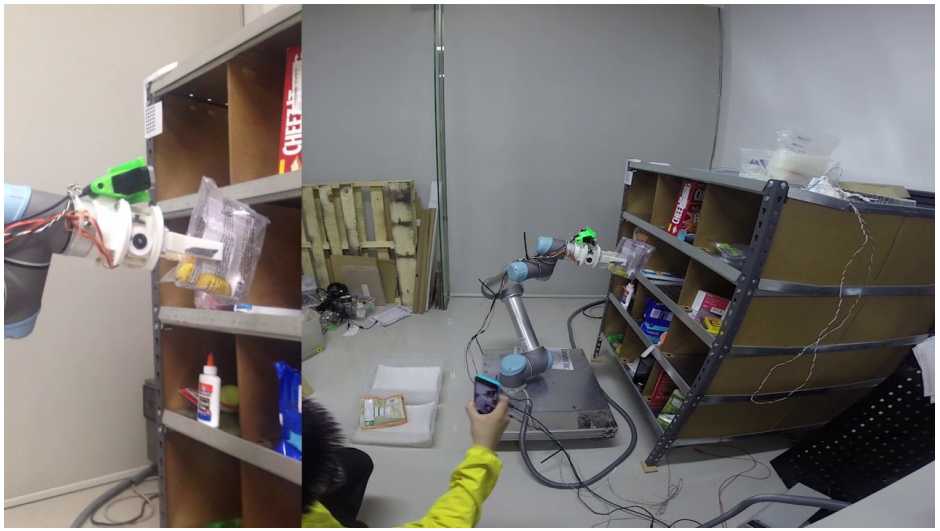
Ex3. Dynamic Workpiece Tracker

- OpenNI for Kinect Driver
- OpenRave for fast IK
- PCL for 3D object recognition and tracking
- Own Implementation



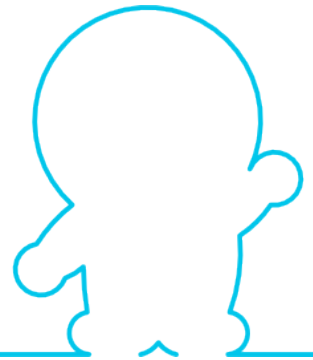
Ex4. Amazon Picking Challenge





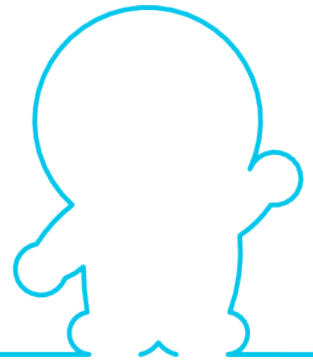
Ex4. Amazon Picking Challenge

- Own development of Realsense driver/ROS package
- PCL
- Moveit
- Rosserial
- Own implementation of grasp plan
- Gripper design, electronics, firmware
- …
- Integrate all parts together



How to use ROS responsibly

- Which slide should you remember?



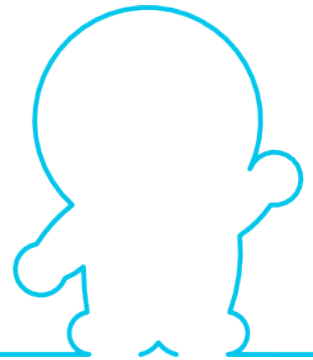
- DO NOT USE ROS IN YOUR FINAL PRODUCT
- DO NOT USE ROS IN YOUR FINAL PRODUCT
- DO NOT USE ROS IN YOUR FINAL PRODUCT

It's important so I'll say it 3 times.

Unless, your product is designed for research or competition.

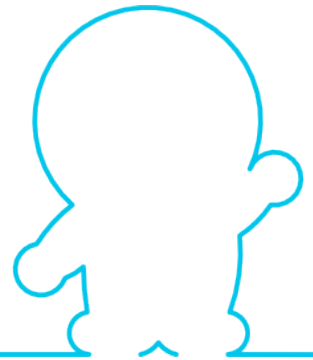
Video: Use ROS for prototyping

A brief tech history of Dorabot



Who is Dorabot?

- We use state-of-the-art robot technologies to solve real-world problems.
- The current “real-world problem” is unmanned warehouses.



We want YOU!

- 机械工程师，特别是设计过移动机器人、减速箱、机械臂、机械手的
- 电子工程师，特别是设计过电机驱动，电池管理，高速通信的
- 软件工程师，特别是擅长 C++/Python, 熟悉 ROS,Gazebo,moveit,
- OpenRave,KDL,PCL,OpenCV 等库的
- Motion Plan, Grasp Plan Research Scientist
- Computer Vision Research Scientist
- Computer Graphics Research Scientist, 特别是擅长点云处理的
- Multi-Robot Scheduling Research Scientist
- 实习生
- 以及 机器人技术狂热 geek
- 不怕你技术不好，就怕你不来骚扰

Dorabot Inc

- 申请全职职位请发邮件到 :jobs@dorabot.com
- 申请实习职位请发邮件到 :intern@dorabot.com
- 更多信息：
- http://www.dorabot.com/jobs/