Open Source Robotics with ROS

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ROS @ foss.in
What is ROS?

- Robot Operating System / Robot Open Source
- A “meta-operating system”
- “The Linux of robotics”

- Goal: Improve robotics research
  - Leverage the work of others
  - Replication of results - good science!
  - Time to productivity:
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What can ROS do?
What features does ROS have?

Core Functionality (ros):
- Message-passing Infrastructure
- Package Management
- Build System, Logging, Testing

Everything else (ros-pkg):
- Hardware Abstraction
- Low-level Device Control
- Simulators/Visualizers
- Math/Geometry Libraries
- Robotics!
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ROS: Distributed Development
We don’t reinvent the wheel.

- OpenCV - Computer Vision
- Eigen - Matrix Algebra
- ODE+Gazebo - Robot Simulator
- KDL - Kinematics and Dynamics
- TREX - High Level Planning
Distributed Processes

- Move computation around the network
- Loose coupling between “nodes”
- Modularity
- License boundaries
Messages, Topics, Services

**Message**  Language-independent data structure

![Message Example](image)

**Topic**  A “channel” on which nodes publish and subscribe to messages

**Service**  Request/reply style communication
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![JointState.msg](image)

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**Client Libraries**

- roscpp
- rospy
- rosoct
- roslisp
- rosjava
General Robot Description
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Let’s Hack!

>Demo featuring a Nokia N900 phone accelerometer controlling a simulated PR2 in gazebo>
Willow Garage Intern Challenge
Open Source, yet commercial-friendly
Federated development model
Growing community
Documentation, code, wiki, mailing lists are at
http://www.ros.org/
Acknowledgements

- Steve Cousins, Brian Gerkey - ideas for slides
- Sunil Thaha (Nokia), Aneesh Muralidharan (VCreate Logic) - N900 demo
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Thank you!

Questions?

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