ROS for Baxter

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Baxter @ ROS Best Practices

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Baxter: a Platform for Manufacturing and Research
Two Sides of Baxter

- Collaborative Robot
- Safe to be around people
  - Even undergrads!
- Two arms, sensors, display...
- Accessible

... and Research Friendly!
Research Areas

- Wide range of Research
- Real world target

http://sdk.rethinkrobotics.com/wiki/Research
One-Robot-Fits-All* Platform

- Full development platform
- Don’t have to develop a robot to test your gripper
  - Focus on your research
- Stand-alone system

Baxter Software Framework

- ROS is our API layer
- Enables the best interface for each case

Diagram:

- User Application
- ROS
- Robot Interface

Diagram elements:
- User
- Dev Machine
- User Code
- ROS Libraries
- Controls
- States
- Actuators
- Sensors
- Embedded
Baxter SDK

Core SDK

- Consists of several packages
- Layered functionality
- Lives in catkin workspace
- Either exists on workstation or via SSH
- Written with Python + ROS
# Baxter SDK

## Core SDK
- **baxter**
- **baxter_common**
- **baxter_interface**
- **baxter_tools**
- **baxter_examples**

### Additional Packages
- **baxter_pykdl**
- **moveit_robots**
- **baxter_simulator**

All available on GitHub!
Baxter’s Series Elastic Actuators

Image Credit: machinedesign.com
Collision Avoidance + Collision Detection

Robot Description: /robot/armnav_robot_description
Arm Controllers (in Python)

- Joint Position
- Joint Velocity
- Joint Torque
Arm Controllers: Position

![Diagram of Arm Controllers: Position](image)
Arm Controllers: Velocity
Arm Controllers: Torque
Movelt! +
Joint Trajectory Action Server
Baxter + Gazebo
Baxter + Gazebo

Credit: Dave Coleman
The SDK Wiki:
sdk.rethinkrobotics.com
Baxter Google Group: 
groups.google.com/a/rethinkrobotics.com/forum
Baxter and ROS: The takeaway

ROS is more than just a protocol

- Data Collection
- Visualization
- Simulation
- Ecosystem
- Modular Packages / Functionality
- Collaboration
- Community
In Conclusion:

Baxter loves the ROS Community!
Amazon picking challenge! @ ICRA 2015

A Baxter will be provided!

$26K in prizes!
Thank you!
Any Questions?