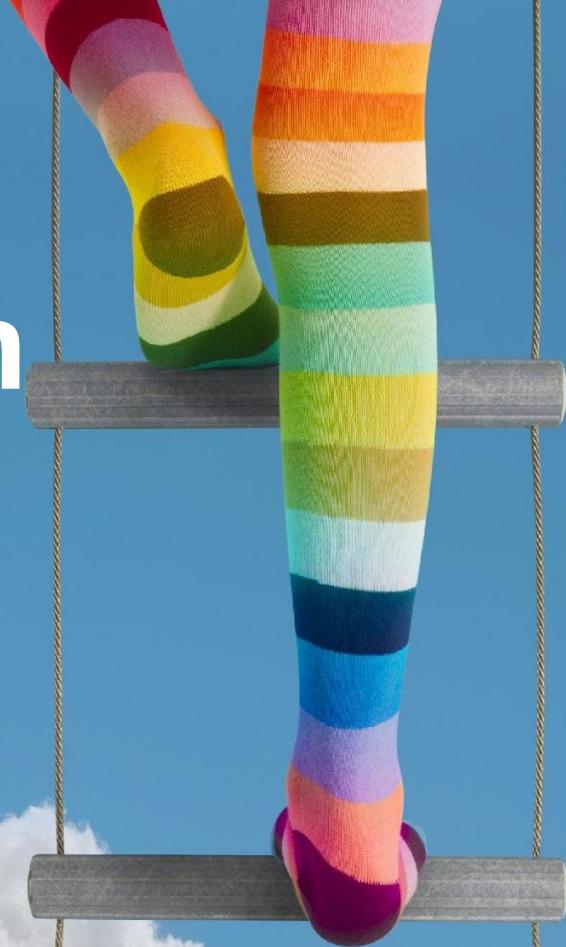


The Robotics Revolution is Open Source

Louise Penna Poubel



Open Source Robotics Foundation

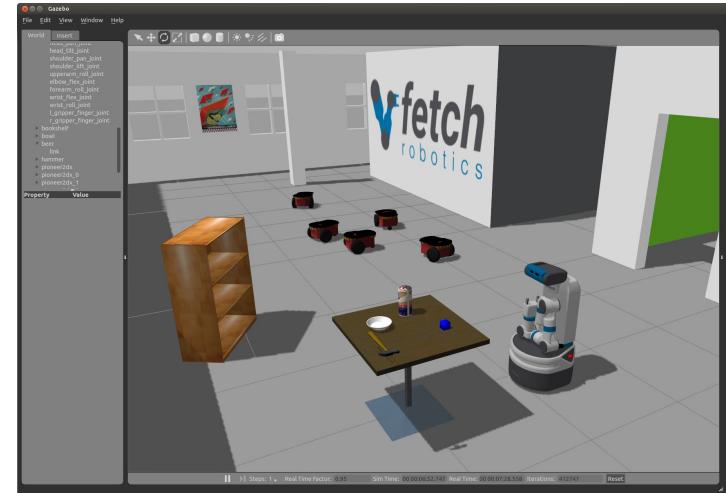
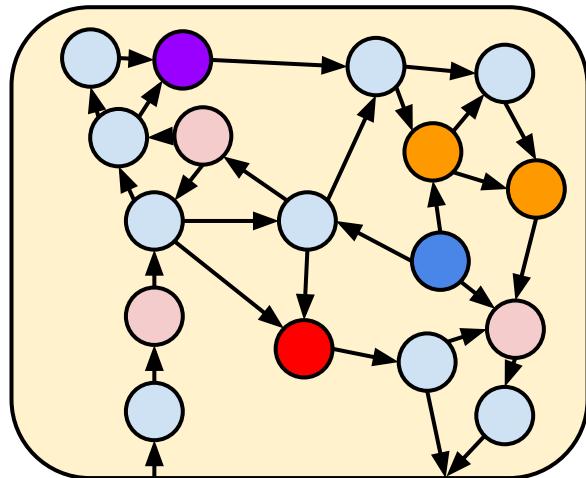


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We are the stewards of two large projects:



 ROS

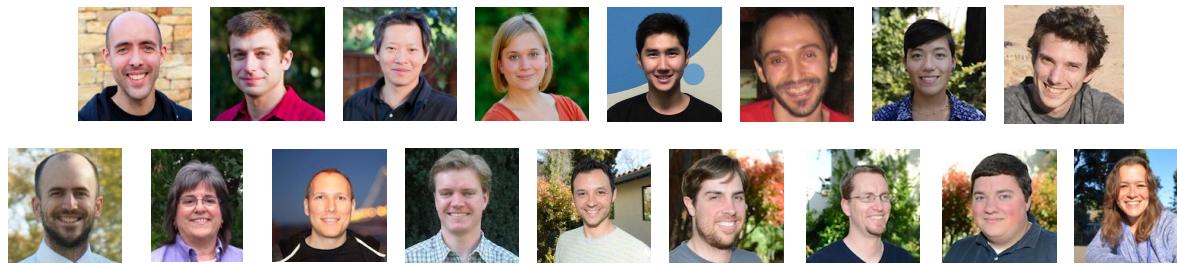
 GAZEBO

 Open Source Robotics Foundation



Open Source Robotics Foundation

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



<http://osrfoundation.org>



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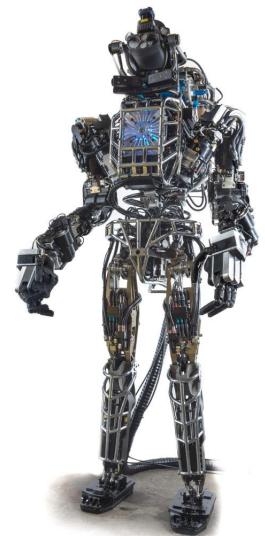
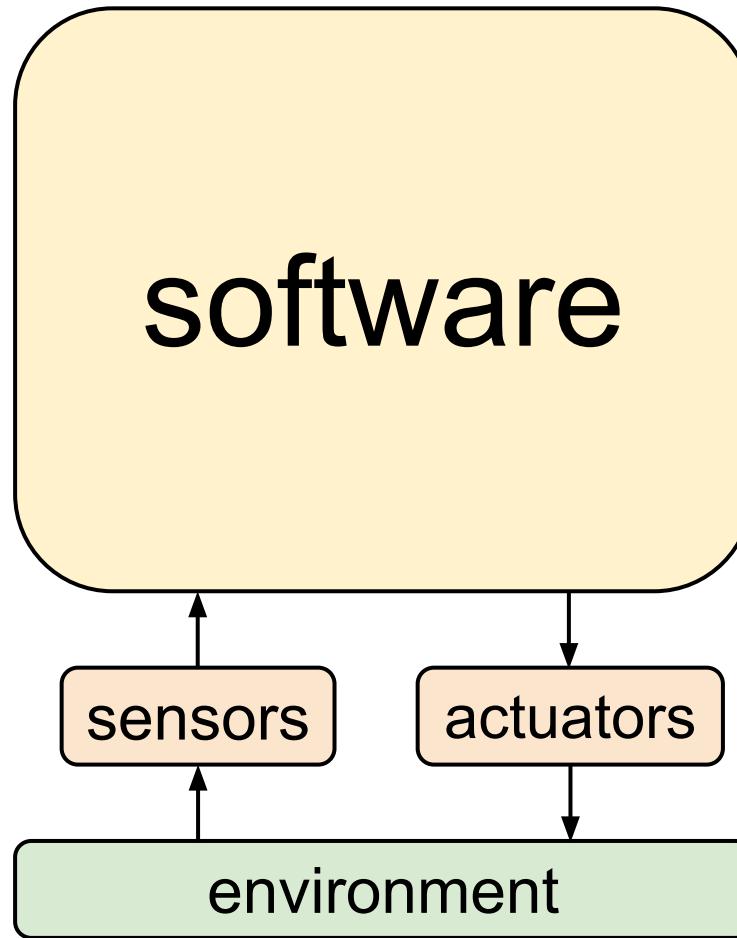
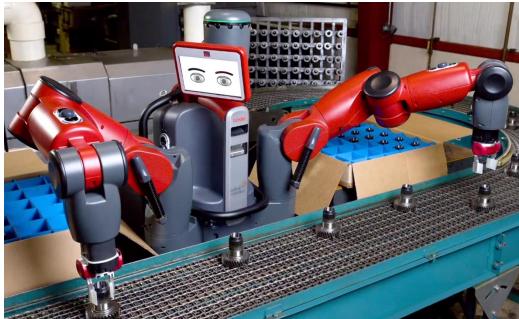
OSRF Sponsors



NISSAN

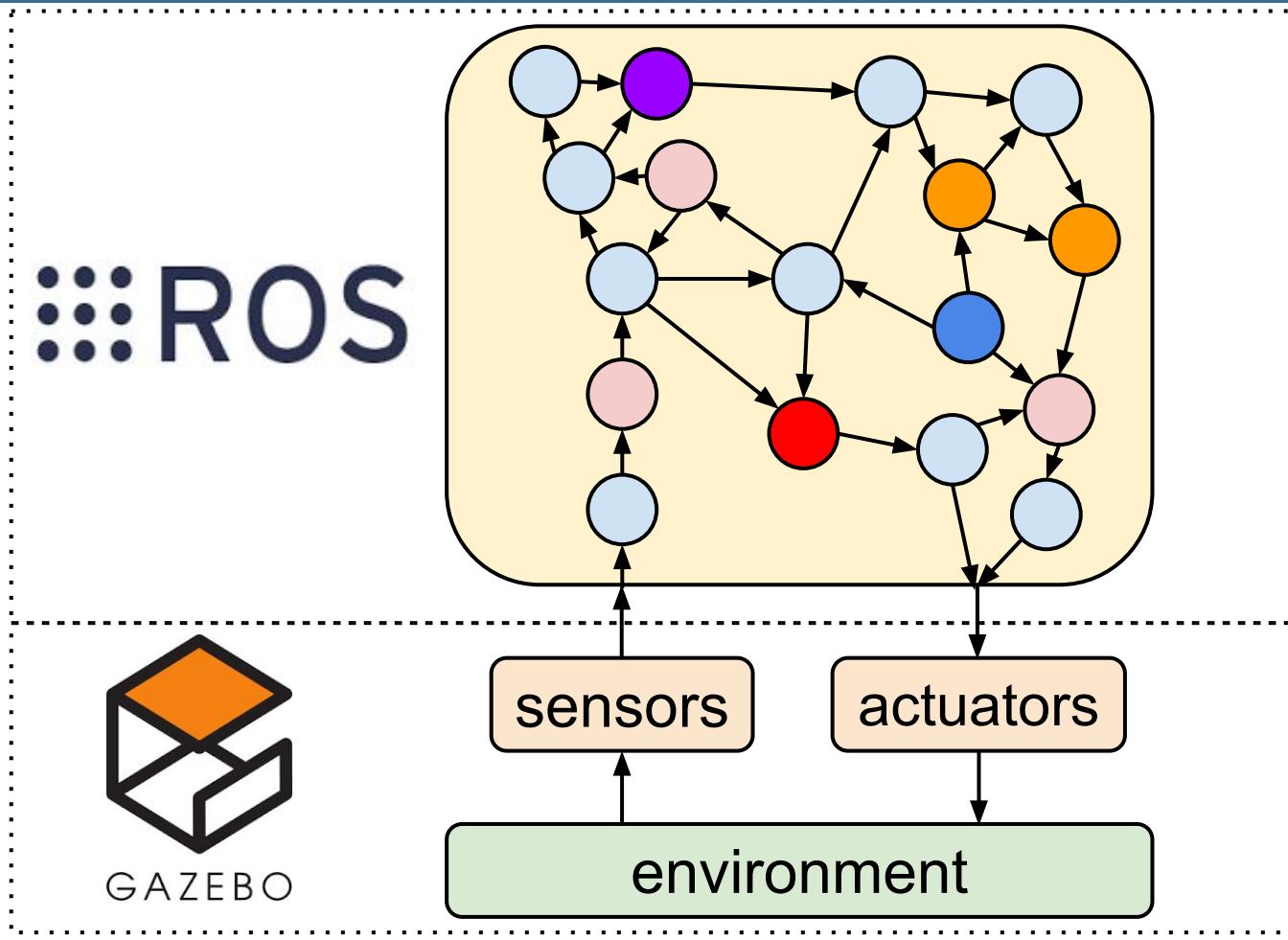


The Problem: Robot software is hard



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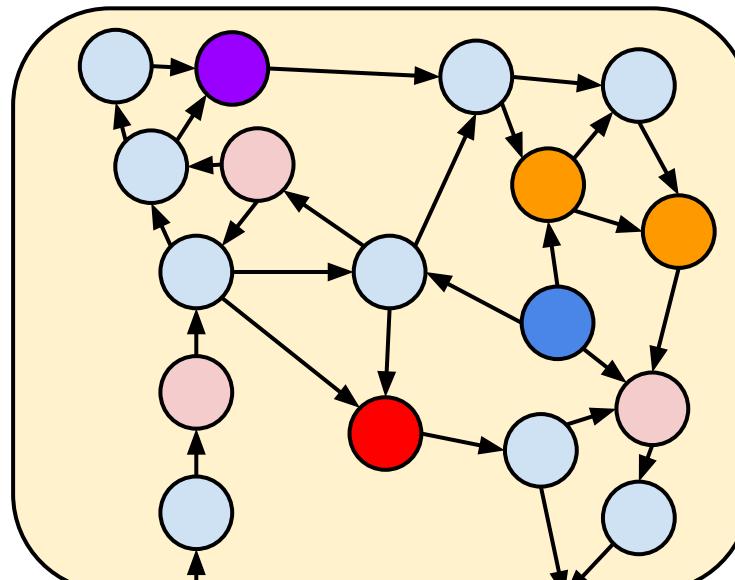
Our Approach: Collaboration, Modularity, and Simulation



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First, make it work in simulation for testing and debugging

 ROS



GAZEBO

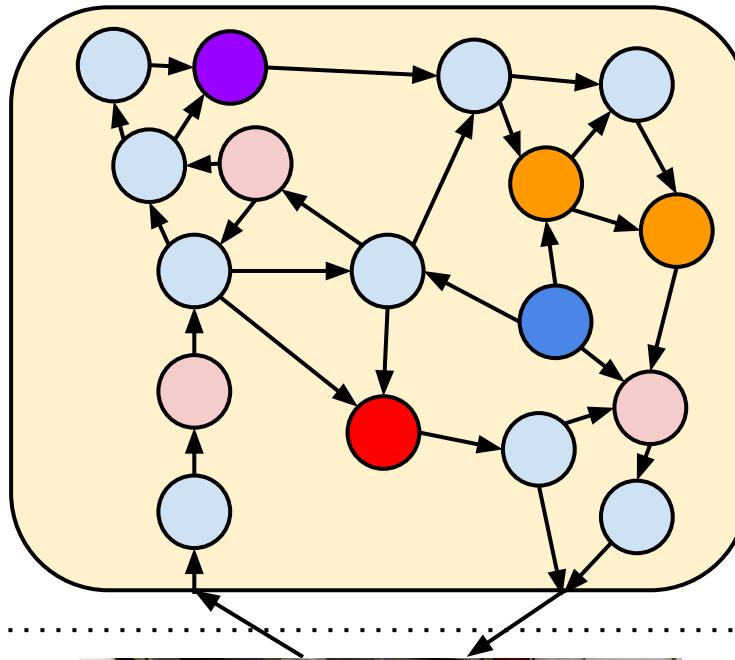


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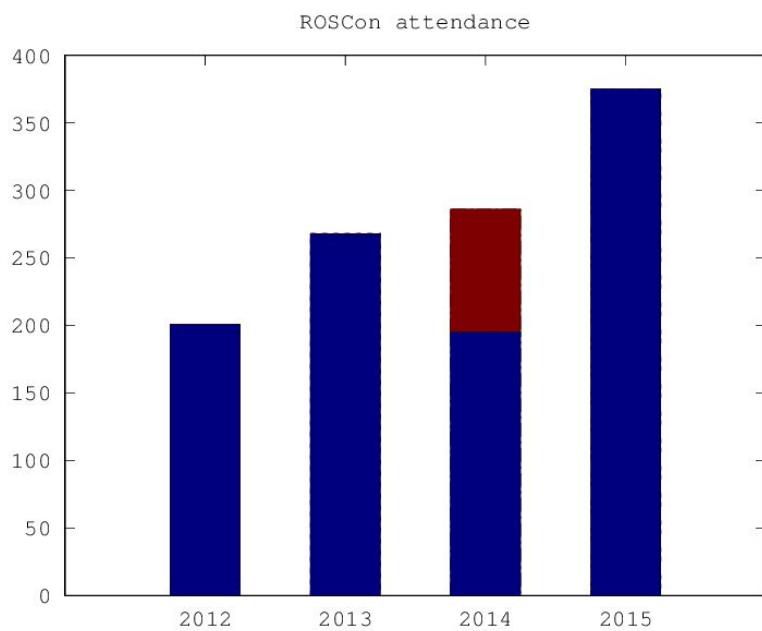
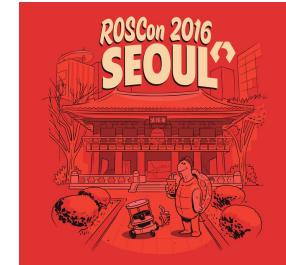
The Goal: Robust, Portable, Tested Robot Software

 ROS



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Ecosystem example: ROSCon



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Who's using ROS? Self-reported (July 2015)



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Who's using ROS and Gazebo?



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DARPA Robotics Challenge: 2012-2015



Of the 23 teams in the DRC Finals:

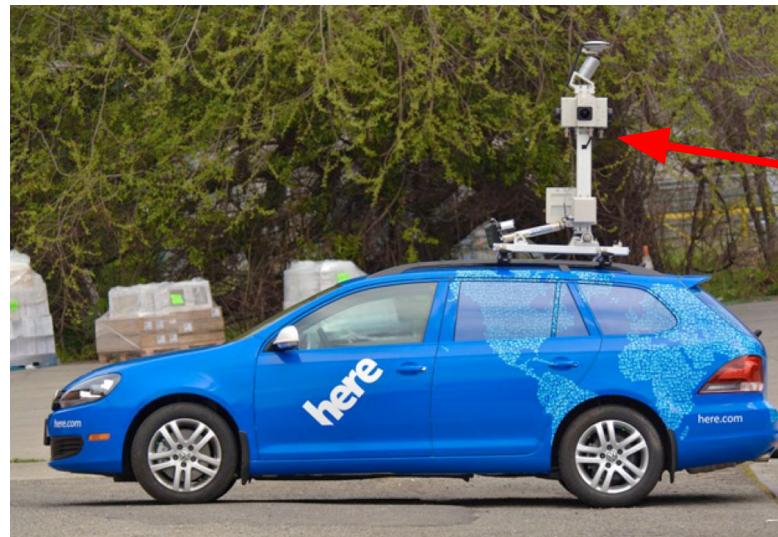
18 teams ran  ROS



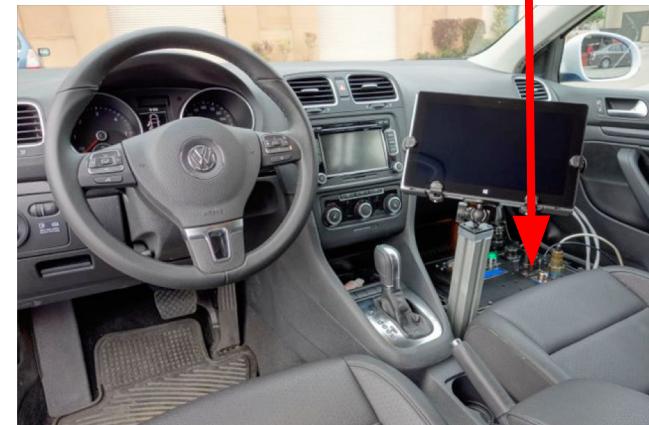
14 teams used  GAZEBO



HERE: 3D Mapping Cars



Sold in Aug 2015 for
\$3B to {Audi, BMW, Daimler}



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Blue River Technologies: Precision Agriculture

not  ROS

 ROS



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BMW: CES 2015 Autonomous-Driving Demos



Car refuses to crash



Car parks itself



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Savioke: Hotel Delivery



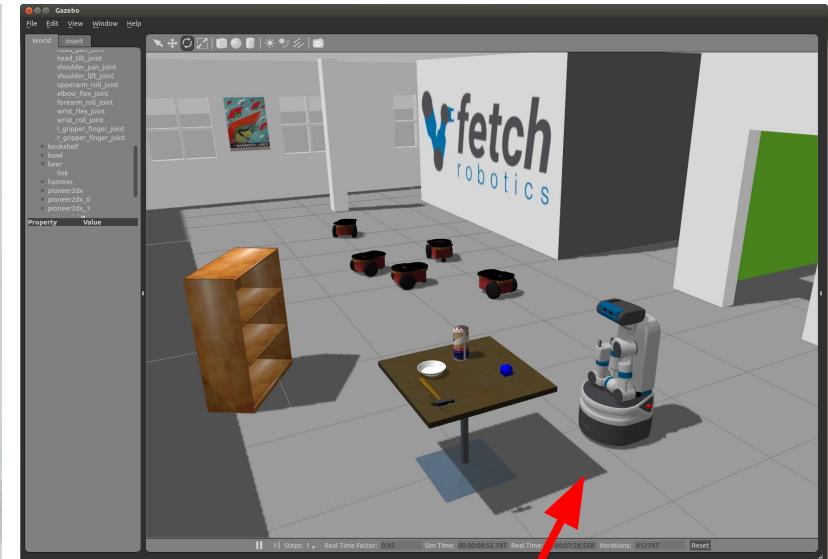
Person requesting beverage

ROS



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Fetch Robotics: Warehouse Management



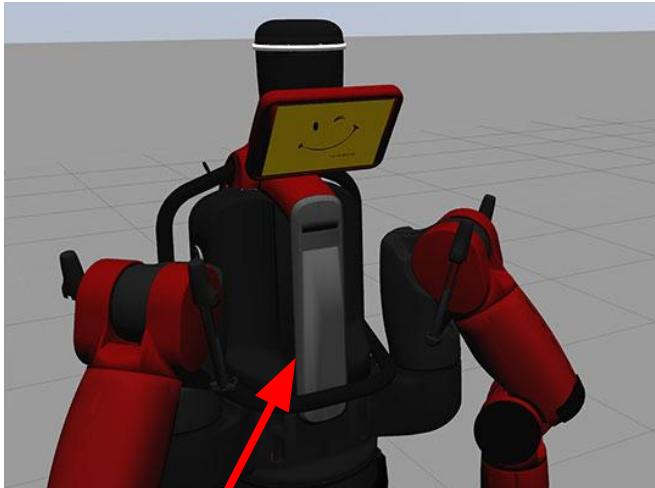
 ROS

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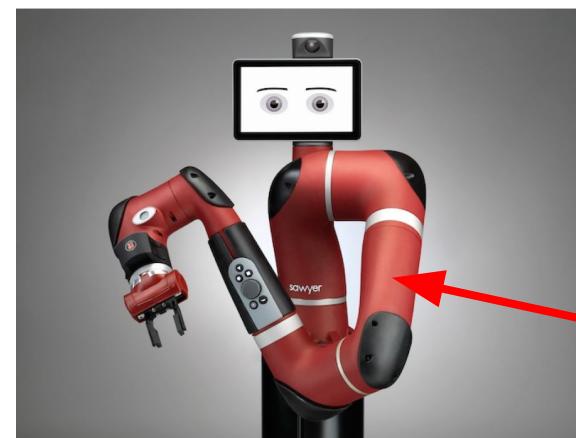


GAZEBO

Rethink Robotics: Baxter & Sawyer



GAZEBO

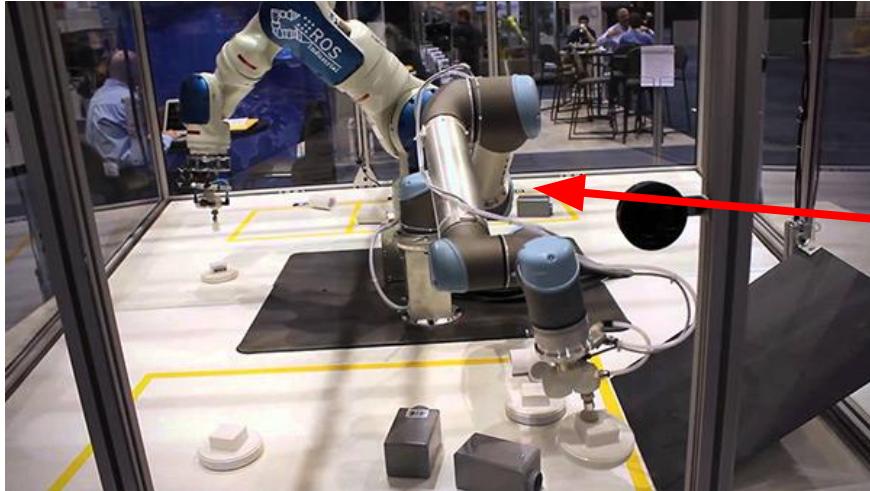


ROS

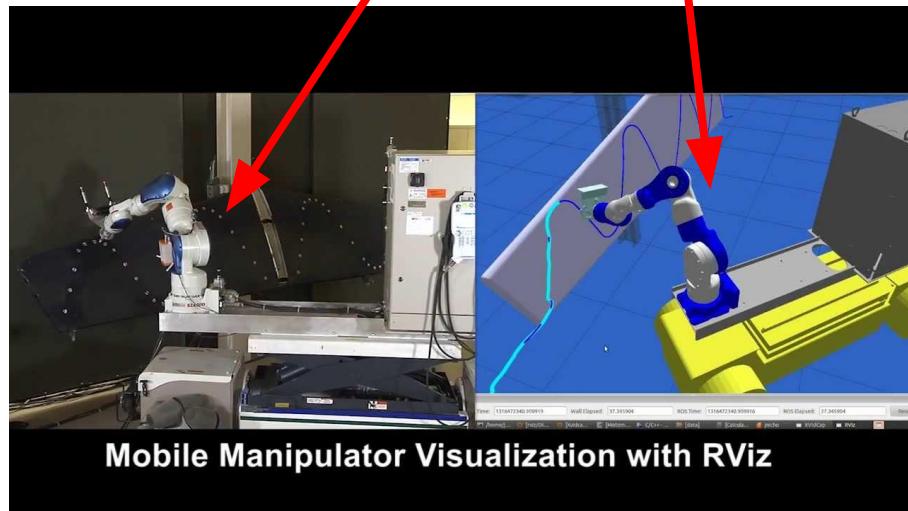


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ROS-Industrial: Smart Factory Automation



ROS



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MathWorks: MATLAB ROS support

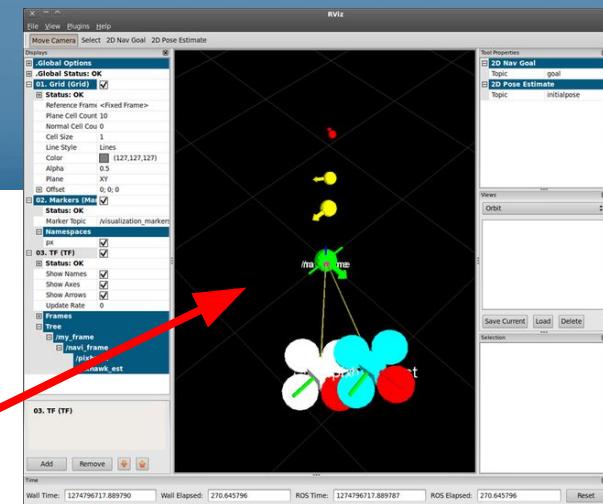
The screenshot shows the MathWorks website's hardware support page. At the top, there's a navigation bar with links for Products & Services, Solutions, Academia, Support, User Community, Events, and Company. Below the navigation, a breadcrumb trail reads "Hardware Support > Robot Operating System (ROS) Support from MATLAB". The main content area has a teal header titled "Hardware Support". Below it, there are three buttons: "Overview", "Search Hardware Support", and "Request Hardware Support". The main content section is titled "Robot Operating System (ROS) Support from MATLAB" in red. It includes a sub-section titled "Create ROS nodes in MATLAB and exchange messages with other nodes on the ROS network, including ROS-enabled robots and simulators." A text block explains how MATLAB supports ROS by allowing users to interact with ROS networks and create self-contained ROS networks directly in MATLAB. Another text block describes how this support extends the rosjava API to create ROS nodes inside MATLAB using the same ROS publisher/subscriber mechanism.



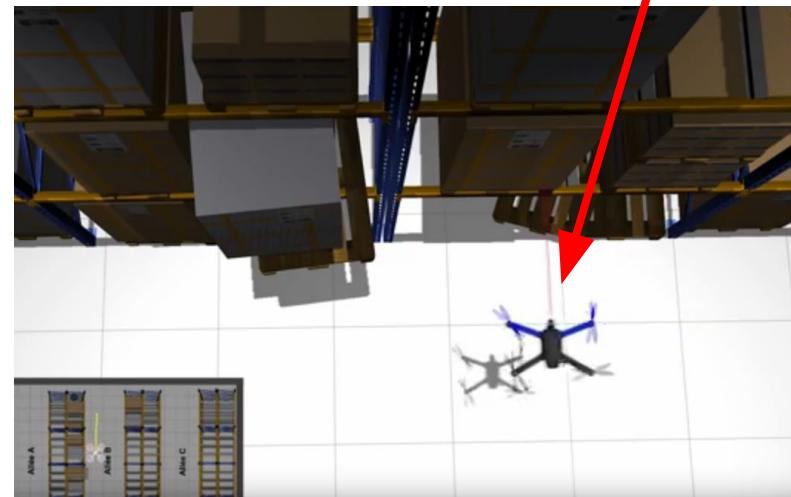
Drones, drones, drones



ROS

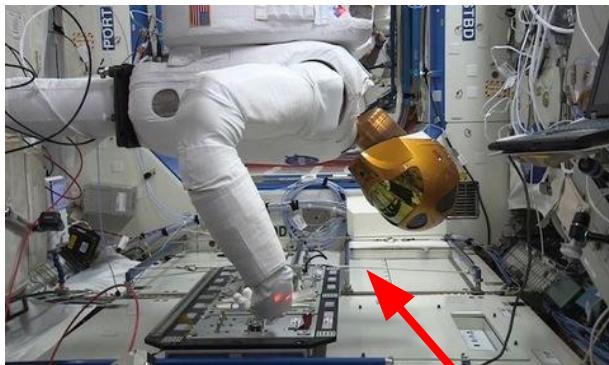


GAZEBO

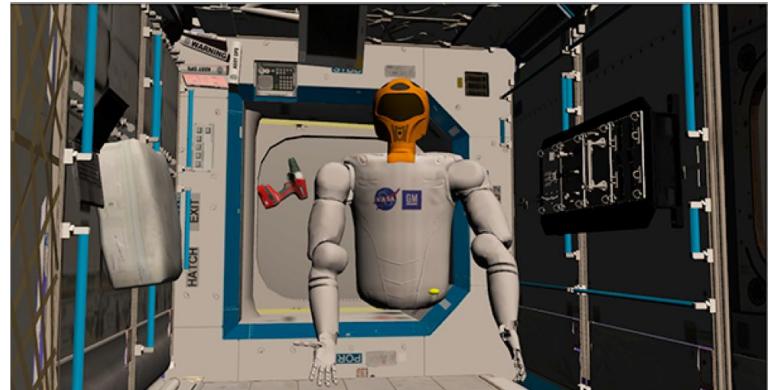


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NASA: Robonaut 2 (on ISS)



 ROS



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Thank you!

Questions?



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