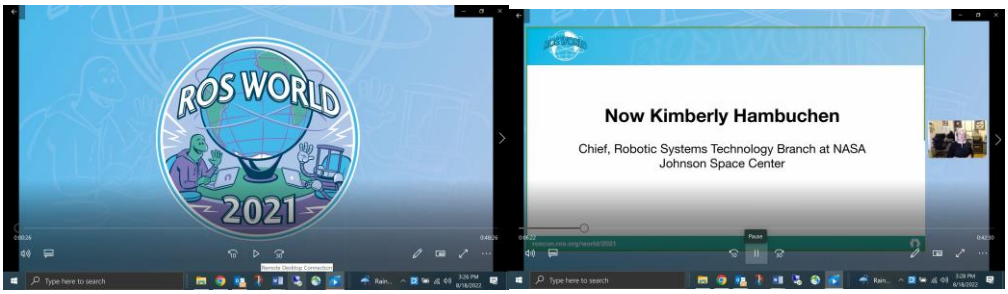
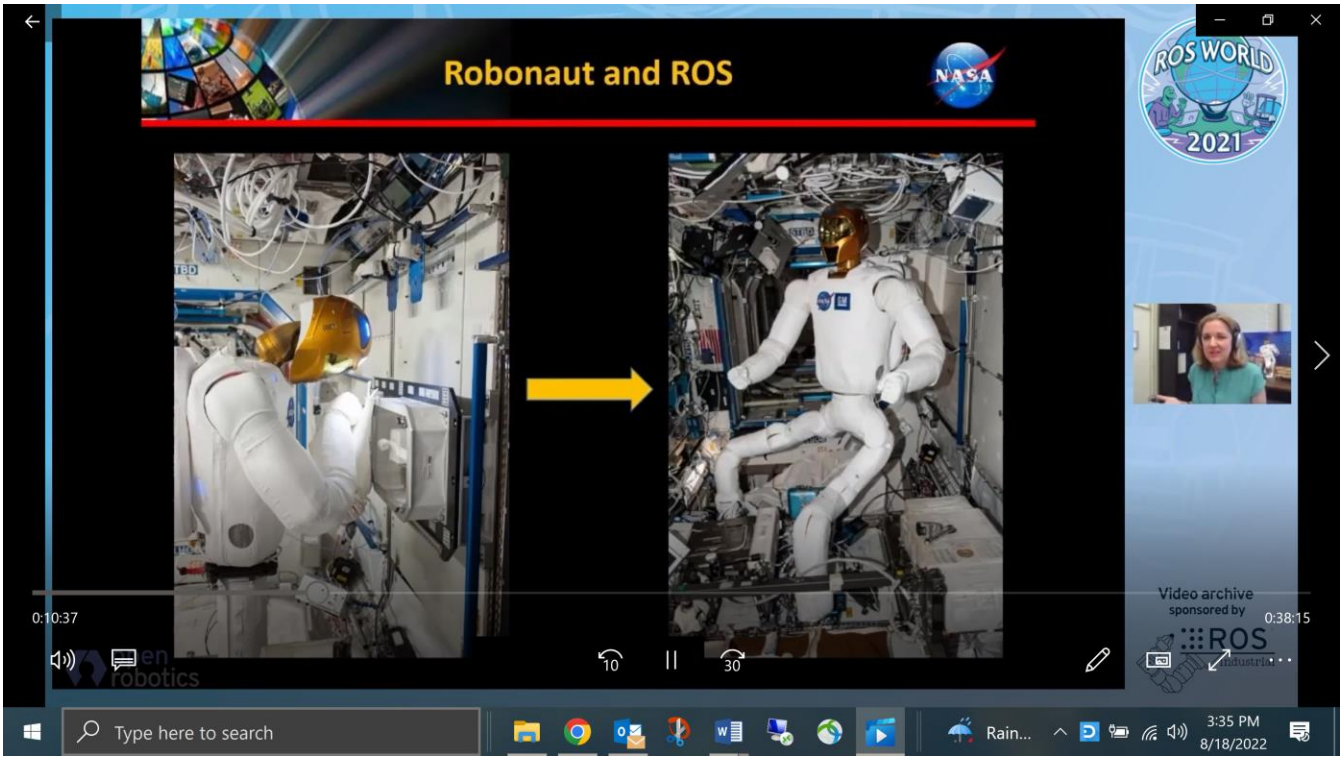
ROS ROBOTS_Local 8/20/2022

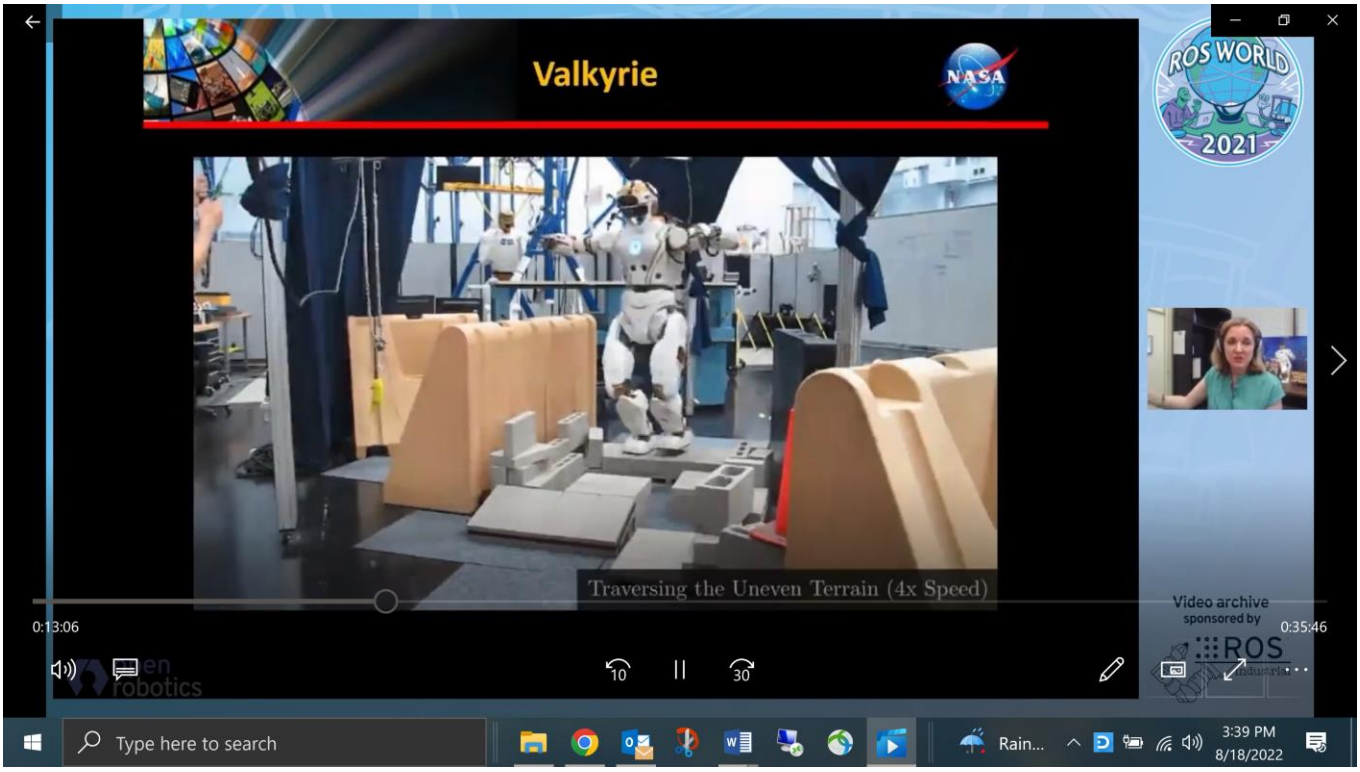
https://www.openrobotics.org/blog/2022/2/2/rosinspace

Dr. Hambuchen's presentation, introduced by Kat Scott

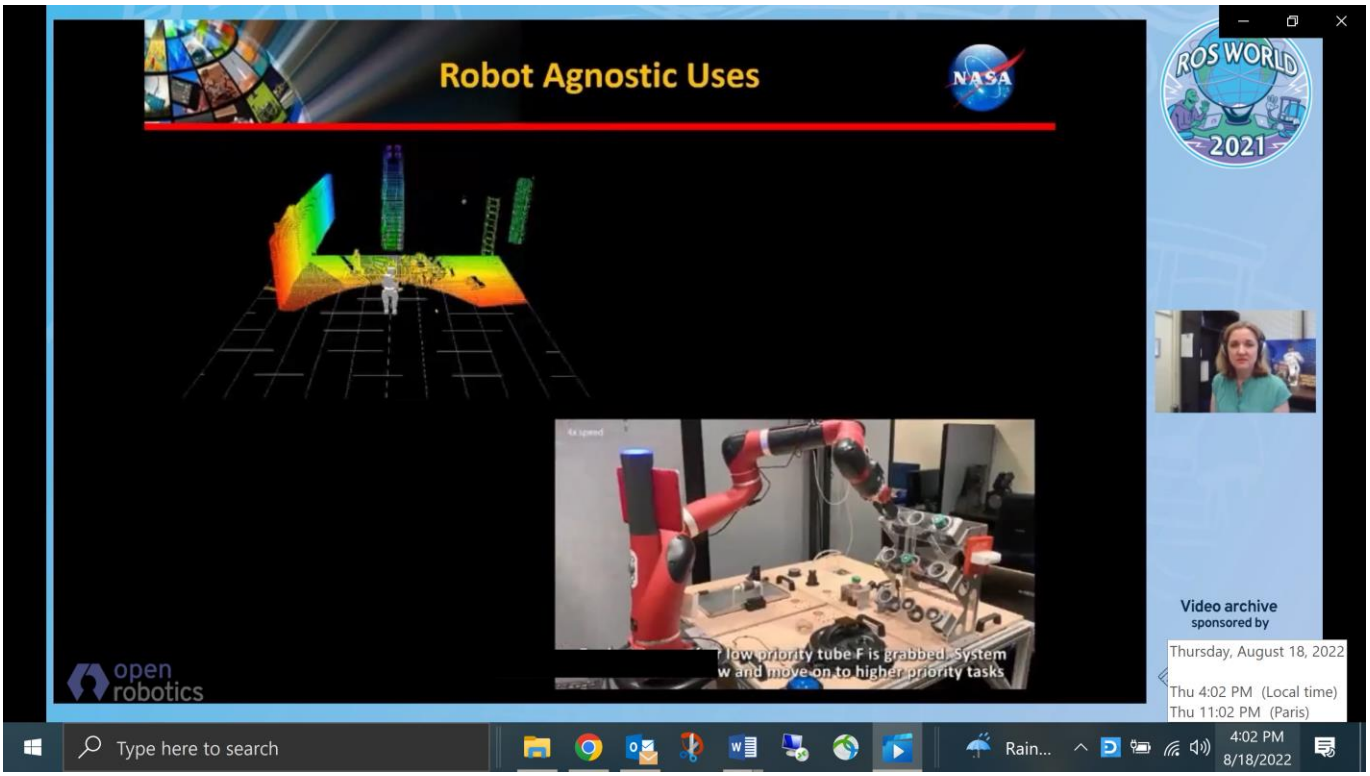


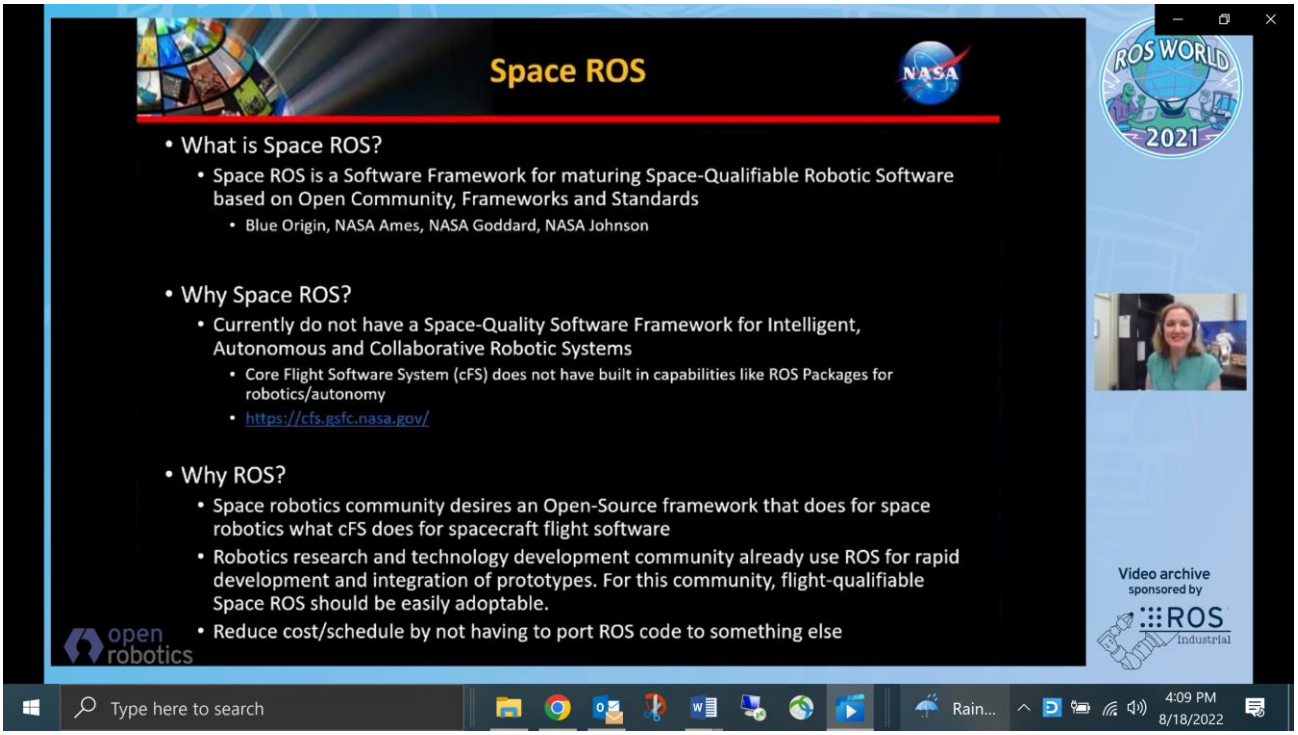
As of July 2022, Acting Deputy, ISS Systems Engineering & Integration Office





SAWYER TRAINS ROBONAUT





Valkyrie : NASA's Most Advanced Space Humanoid Robot
53,257 views •Aug 21, 2019

https://www.youtube.com/watch?v=4QSUaH5Hj10

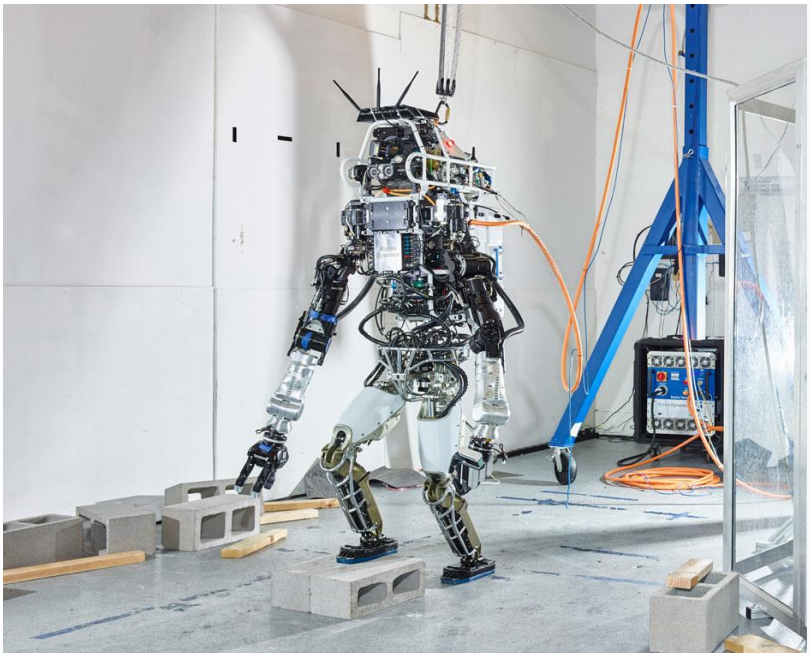
When NASA started working on its next robot, Robonaut 5 (R5), also called Valkyrie, it used ROS from the beginning. It also continued to use Gazebo for testing and development of the robot. R5 later competing in the DARPA Robotics Challenge.

Local group places high in DARPA Robotics Challenge:

https://traclabs.com/

TRACLabs developed control software and human-robot interfaces for the Boston Dynamics ATLAS humanoid robot as part of the DARPA Robot Challenge.

https://spectrum.ieee.org/automaton/robotics/humanoids/darpa-robotics-challenge-trials-results



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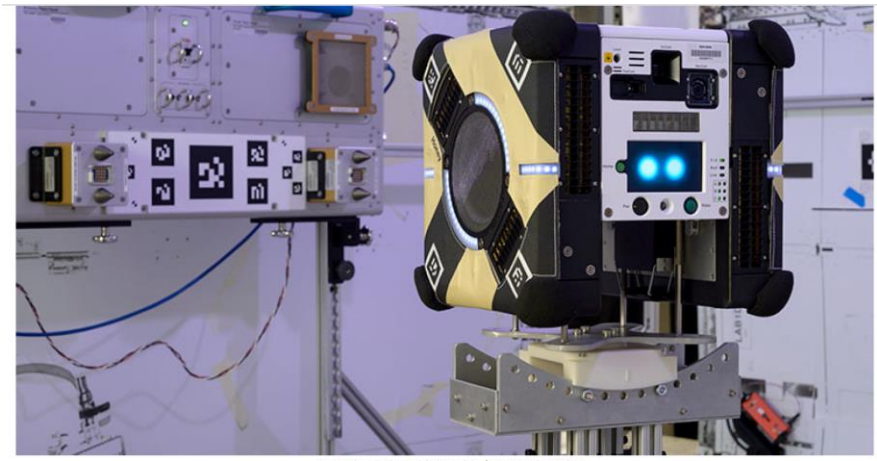
VIGIR	8
KAIST	8
HKU	3
DRC-HUBO	3
CHIRON	0
NASA-JSC	0
MOJAVATON	0

https://www.therobotreport.com/open-robotics-developing-space-ros/

Astrobee aboard the ISS. | Source: NASA

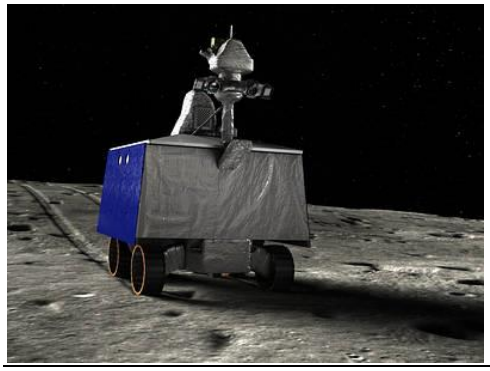


Astrobee aboard the ISS. | Source: NASA

Open Robotics is working with **Blue Origin**, the sub-orbital spaceflight company founded by Jeff Bezos, and NASA on Space ROS. **Space ROS is a version of ROS 2** meant to meet verification and validation requirements aerospace software must meet before being used in a mission.

The Robot Operating System (ROS) been used in space activities for over a decade now. Its use began at ROSCon 2012, where NASA presented its use of ROS in the Robonaut 2 (R2) humanoid robot. NASA switched R2's software over to ROS and used Gazebo, Open Robotics' 3D robotics simulator, to build a model of the robot and the International Space Station (ISS).

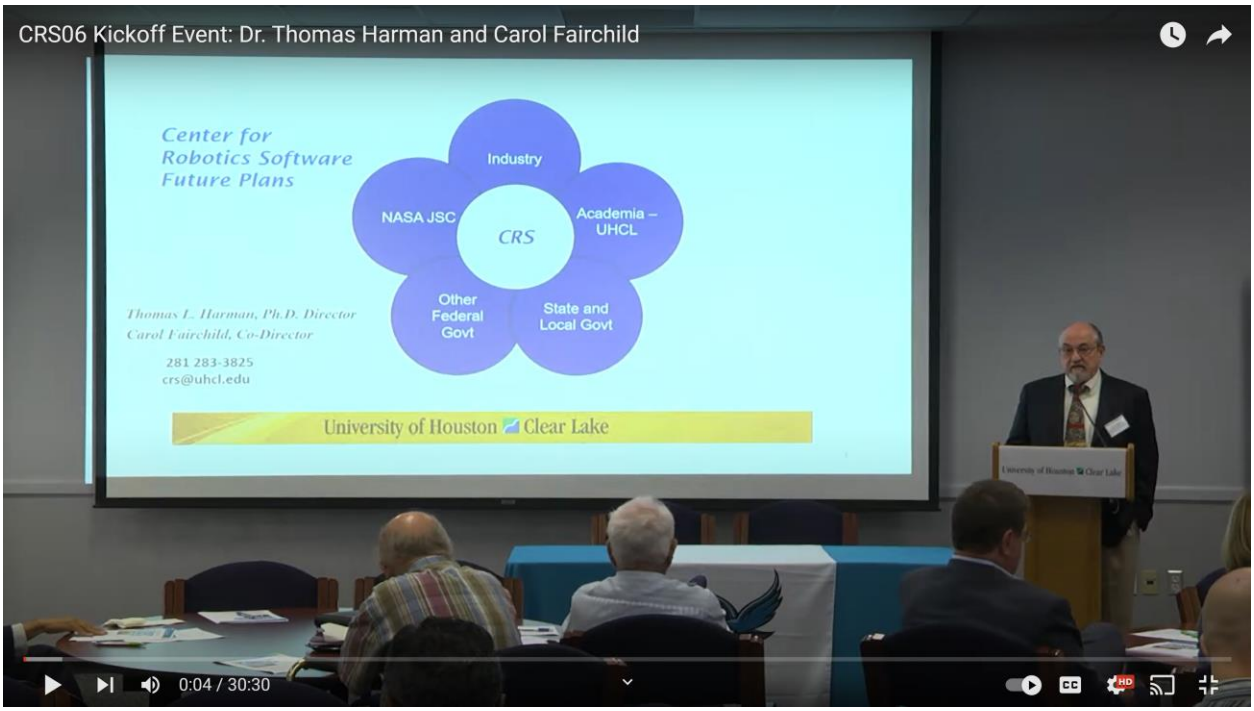
Currently, NASA and Open Robotics are working on the **VIPER program**. The goal of VIPER is to send a mobile robot to the South Pole of the Moon in 2023. ROS 2 will be in the control loop for the rover.



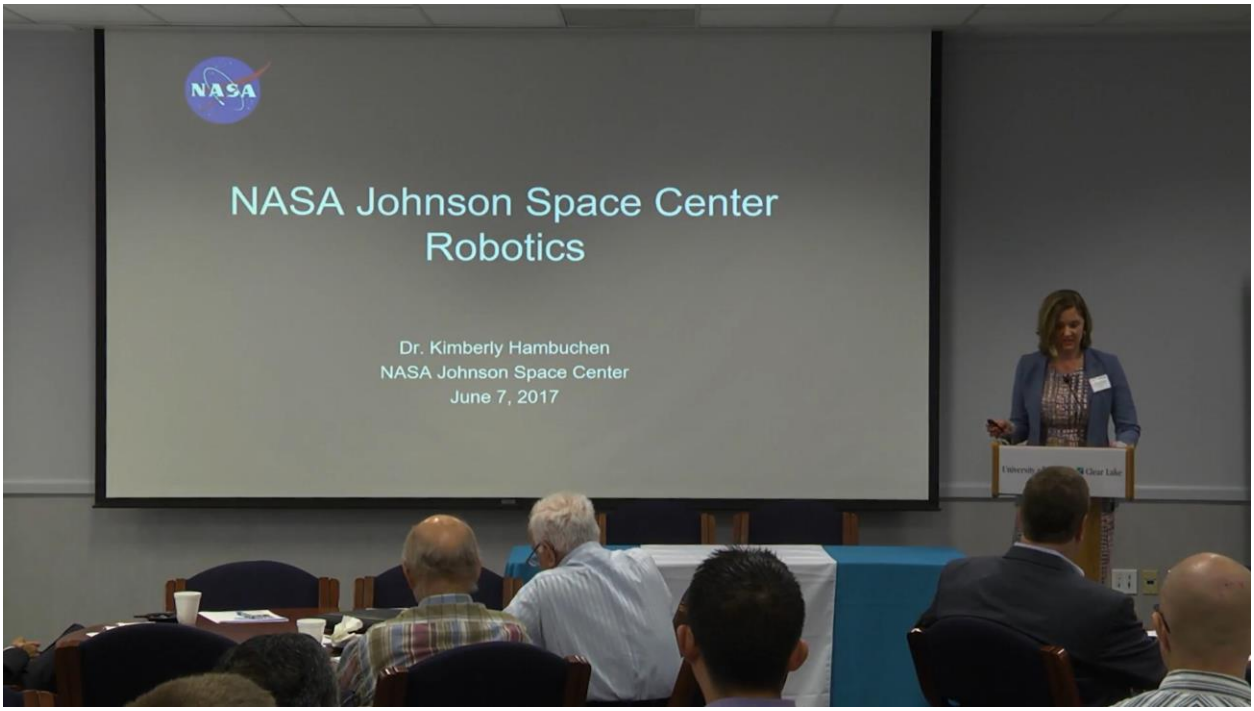
GREAT ROBOTS AT NASA JSC

OUR KICKOFF EVENT

https://www.youtube.com/watch?v=EJ3ucmytlzw&t=226s



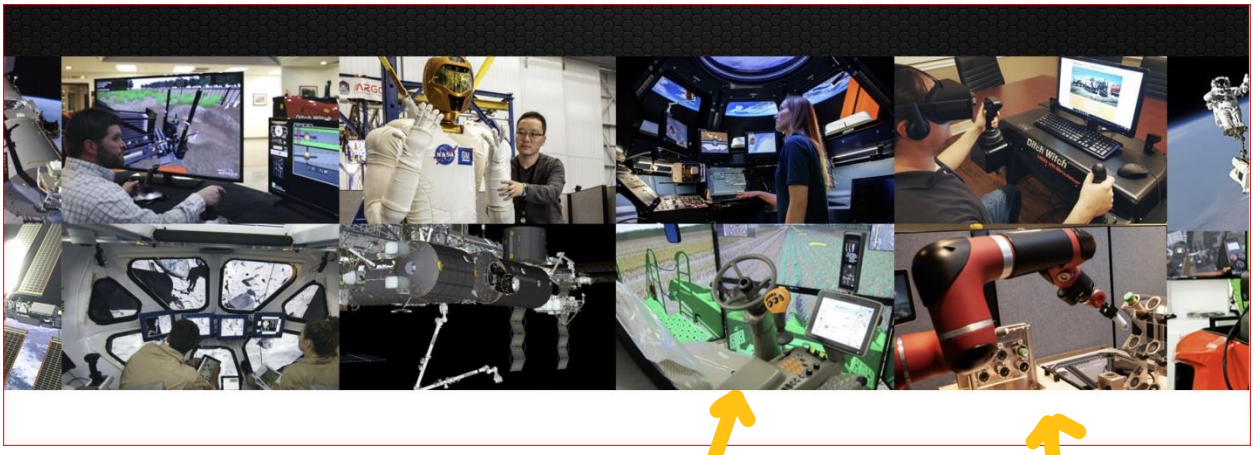
https://www.youtube.com/watch?v=NZSVpY7GBto&t=13s



METECS https://metecs.com/
1030 Hercules Ave.

On December 6th 2021, the 3rd RFID Recon Science activity took place in the International Space Station. In this operation, METECS employees tested the advanced RFID homing capabilities that the Recon add-on RFID module gives the Astrobee freeflying robot. (You can read more about the Astrobee robot here: https://www.nasa.gov/astrobee)

https://metecs.com/robotics/



Combine Simulator

Sawyer

Sawyer Collaborative Robot Montage (extended version) 2:03

https://www.youtube.com/watch?v=1Fugn9YQFOQ&feature=em-subs_digest

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Universal Robotics- In heavy use at NASA and RICE

UR is the leading developer of cobot arms and owns roughly a 40% share of the entire market.

http://wiki.ros.org/Industrial

The Universal Robots ROS Driver is available at UR's GitHub account.

https://github.com/UniversalRobots

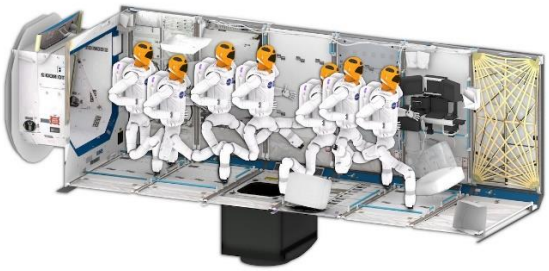
ROS2 Drive for UR robots 21:57

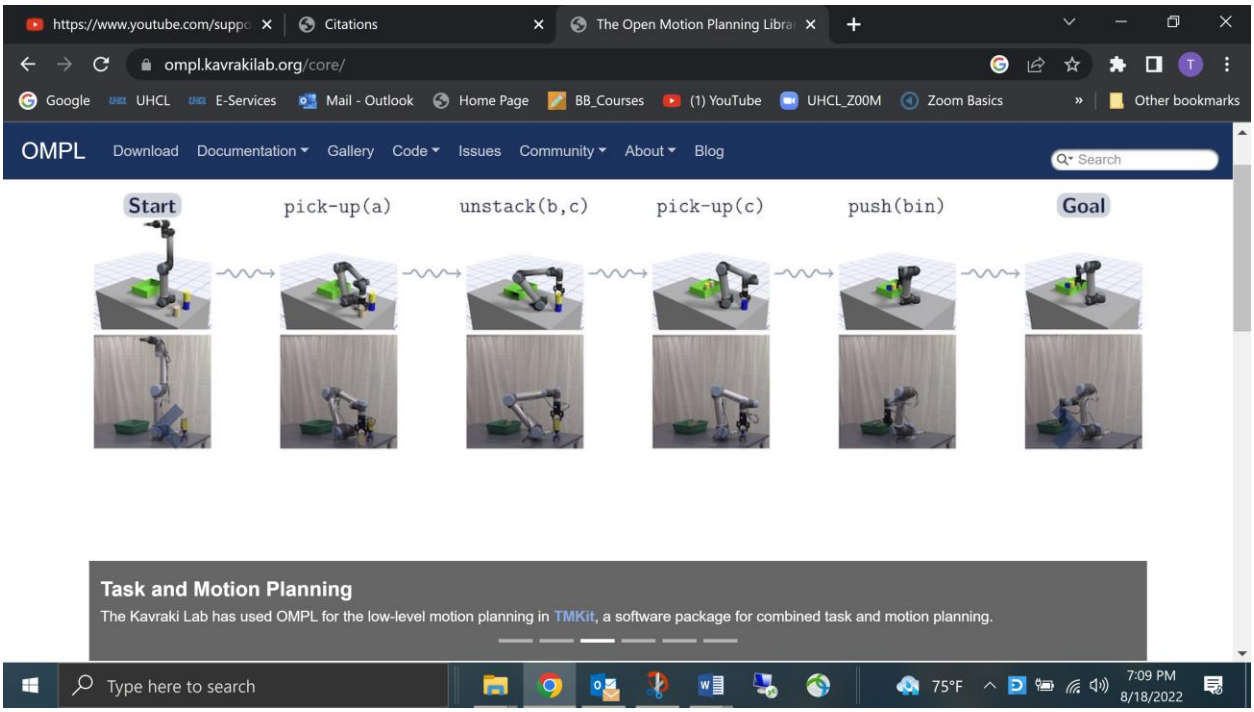
https://www.therobotreport.com/picknik-developing-official-ros-2-driver-ur-cobots/

he UR ROS 2 driver is based on the original **Universal_Robots_ROS_Driver for ROS 1** and will be fairly similar. However, it will take advantage of new ROS 2 features such as component nodes and zero-memory copy integration with ros_control. From a performance perspective, the major benefit is decreased latency.

Kavriki Lab at RICE University

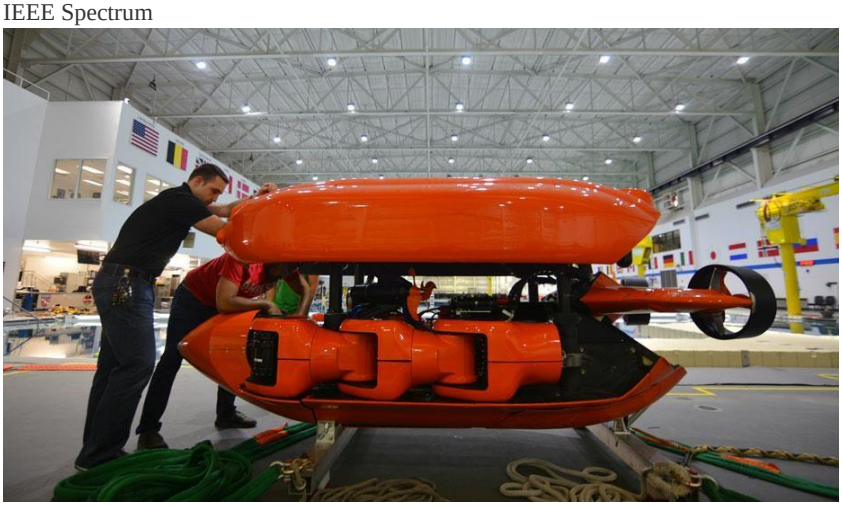
OMPL, the Open Motion Planning Library, consists of many state-of-the-art sampling-based motion planning algorithms.





Meet Aquanaut, the Underwater Transformer

IEEE Spectrum



Houston Mechatronics (HMI) NOW

HMI is planning on maintaining high-level supervisory control over Aquanaut, while delegating most of the low-level decisions to the robot's powerful onboard computers, which run the Robot Operating System, or ROS, a popular software platform for research and commercial robots. Using the sensor suite in the head, which includes stereo cameras, a structured light sensor, and a sonar system, the robot constructs a detailed 3D rendering of its surroundings. But instead of trying to send the entire 3D map back to the operator, only very small and highly compressed subsections are transmitted, and the operator can then match them to an existing model of the structure that Aquanaut is looking at. 3:12
https://www.youtube.com/watch?v=shimvNXyVtw

IEEE SPECTRUM July 25, 2019 https://spectrum.ieee.org/robotics/humanoids/meet-aquanaut-the-underwater-transformer

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Robonaut on ISS Mar 15, 2012

http://youtu.be/RpAUuOCmMO0

Nick Radford

Robonaut had grounding problem and was returned to Earth. (Pun intended)

Robonaut 2 operating in NASA's anti-gravity room (ARGOS) at JSC Building 9
97 views •Sep 18, 2019

https://www.youtube.com/watch?v=GbVZJ4gEzB0

A WINNING TEAM:
Team 118's robot for the 2019 FIRST Robotics Competition, Deep Space.