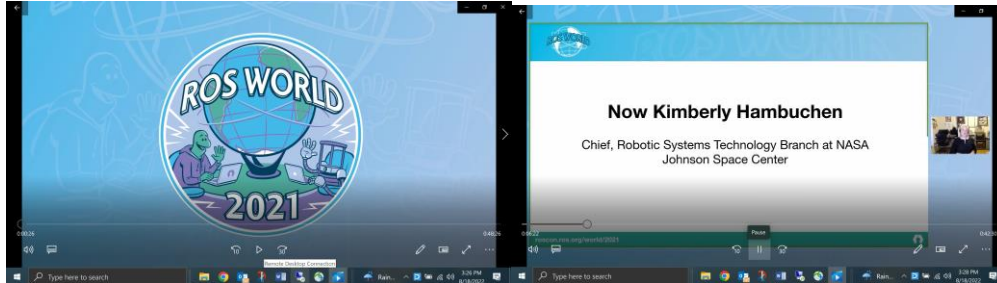


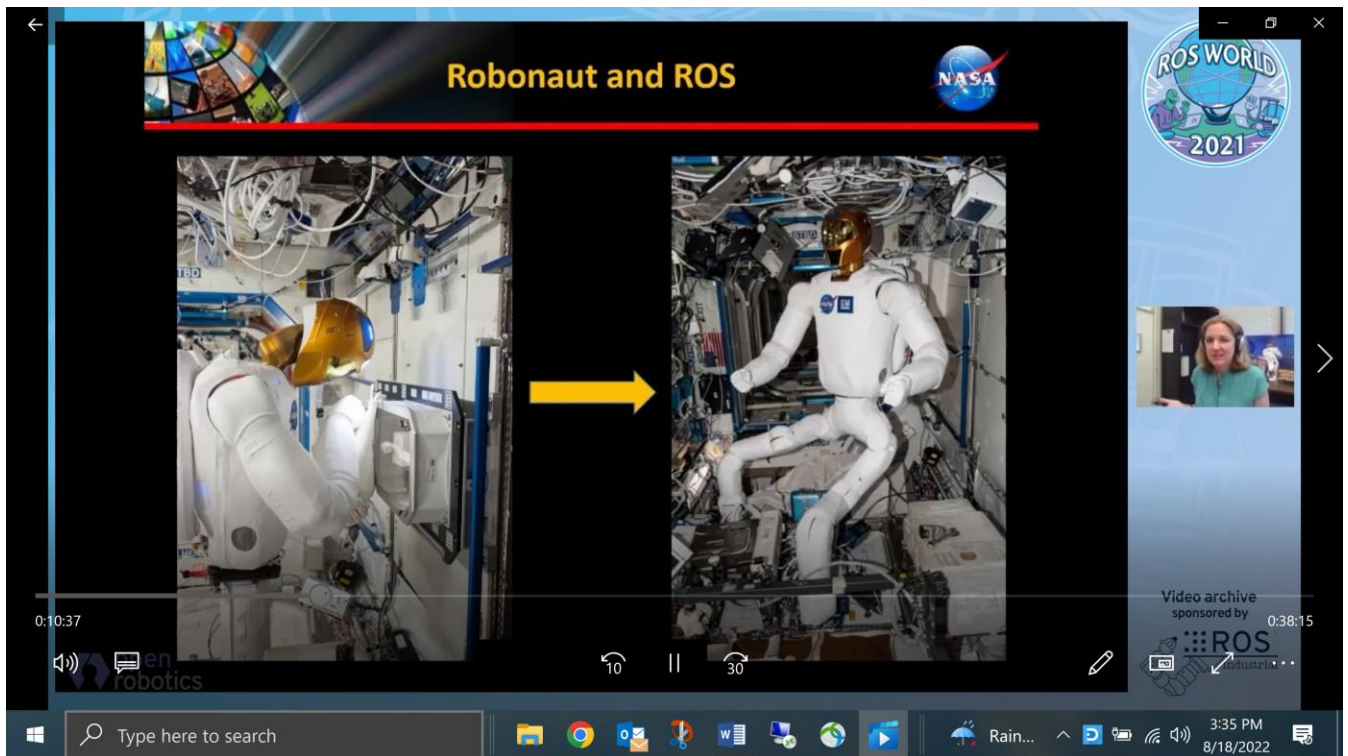
ROS ROBOTS_Local 8/20/2022


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

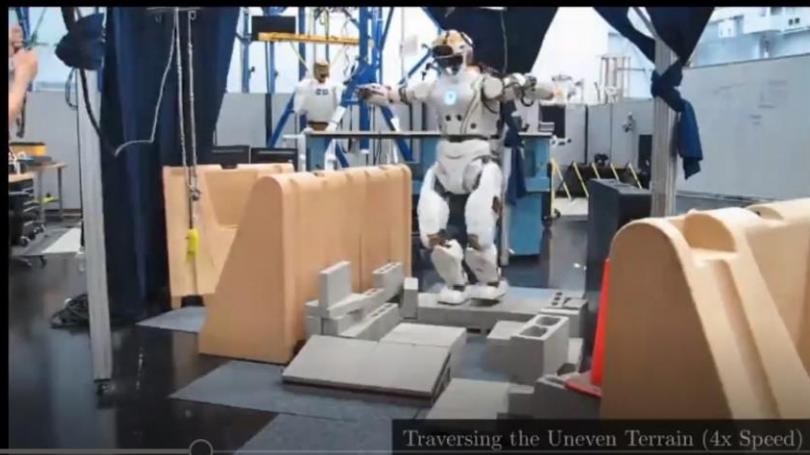
Dr. Hambuchen's presentation, introduced by Kat Scott



As of July 2022, [Acting Deputy, ISS Systems Engineering & Integration Office](#)



Valkyrie 



Traversing the Uneven Terrain (4x Speed)


0:13:06

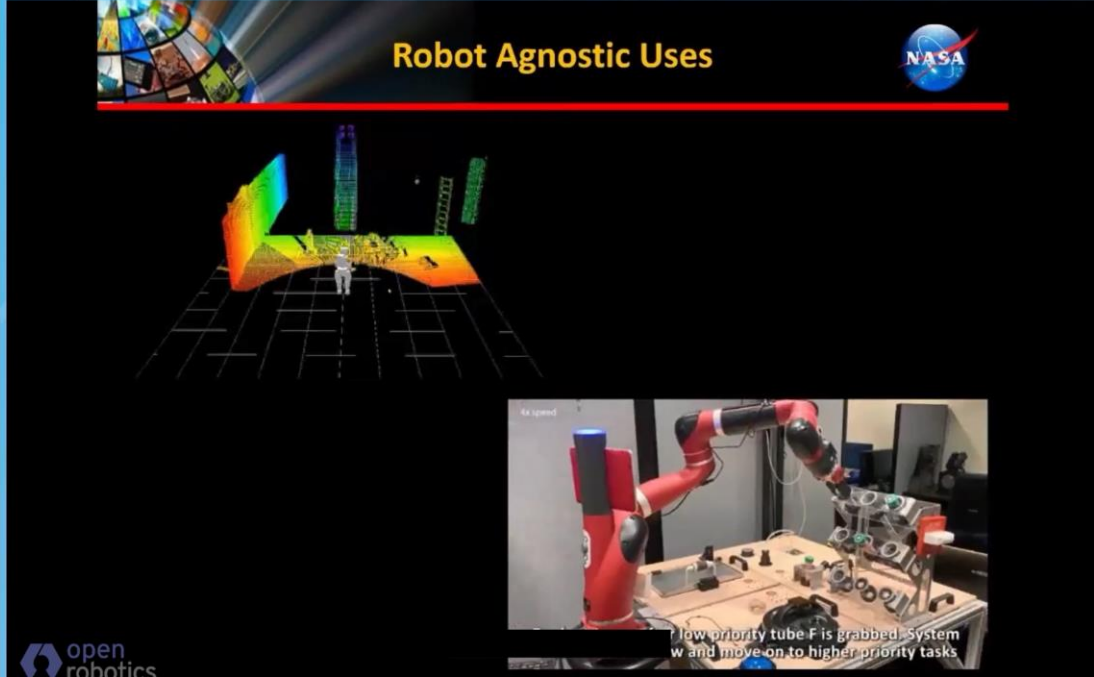
open robotics

Video archive sponsored by ROS 0:35:46

3:39 PM 8/18/2022

SAWYER TRAINS ROBONAUT

Robot Agnostic Uses 



low priority tube F is grabbed. System w and move on to higher priority tasks

open robotics

Video archive sponsored by ROS

Thursday, August 18, 2022

Thu 4:02 PM (Local time)
Thu 11:02 PM (Paris)

4:02 PM 8/18/2022

Space ROS

- What is Space ROS?
 - Space ROS is a Software Framework for maturing Space-Qualifiable Robotic Software based on Open Community, Frameworks and Standards
 - Blue Origin, NASA Ames, NASA Goddard, NASA Johnson
- Why Space ROS?
 - Currently do not have a Space-Quality Software Framework for Intelligent, Autonomous and Collaborative Robotic Systems
 - Core Flight Software System (cFS) does not have built in capabilities like ROS Packages for robotics/autonomy
 - <https://cfs.gsfc.nasa.gov/>
- Why ROS?
 - Space robotics community desires an Open-Source framework that does for space robotics what cFS does for spacecraft flight software
 - Robotics research and technology development community already use ROS for rapid development and integration of prototypes. For this community, flight-qualifiable Space ROS should be easily adoptable.
 - Reduce cost/schedule by not having to port ROS code to something else

open robotics

NASA

ROS WORLD 2021

Video archive sponsored by ROS Industrial

Type here to search

Rain... 4:09 PM 8/18/2022

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.

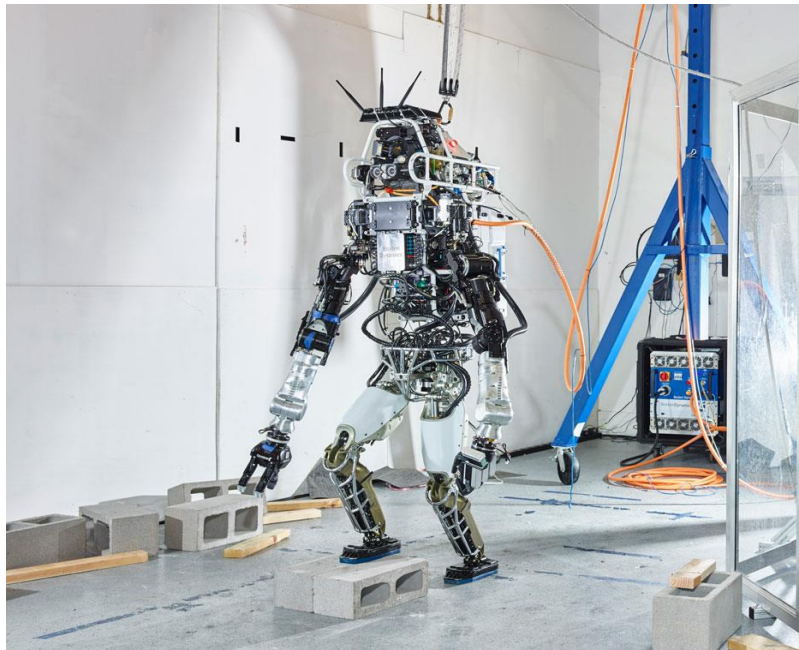


Local group places high in DARPA Robotics Challenge:

<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>

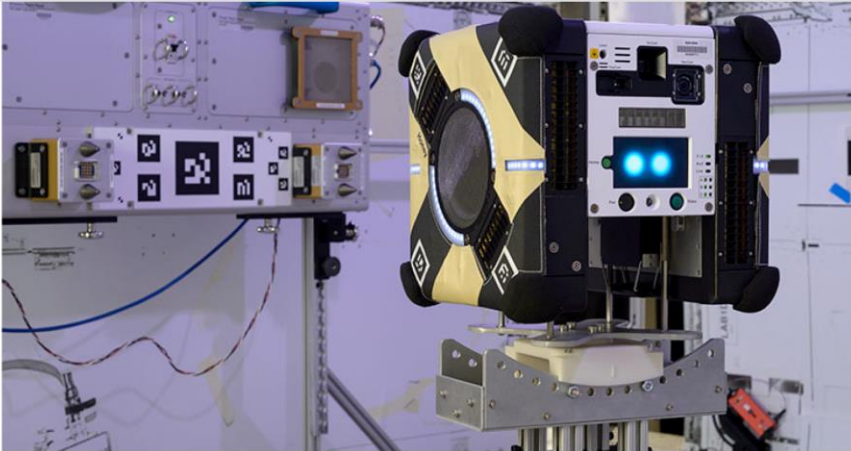


FINAL SCORES	
SCHAFT	27
IHMC ROBOTICS	20
TARTAN RESCUE	18
MIT	16
ROBOSIMIAN	14
TRACLABS	11
WRECS	11
TROOPER	9
THOR	8
VIGIR	8
KAIST	8
HKU	3
DRC-HUBO	3
CHIRON	0
NASA-JSC	0
MOJAVATON	0



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

Astrobee aboard the ISS. | Source: NASA

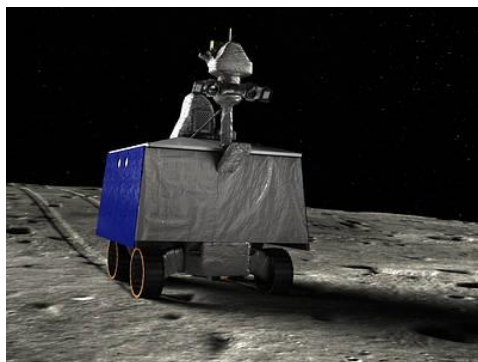


Astrobee aboard the ISS. | Source: NASA

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.

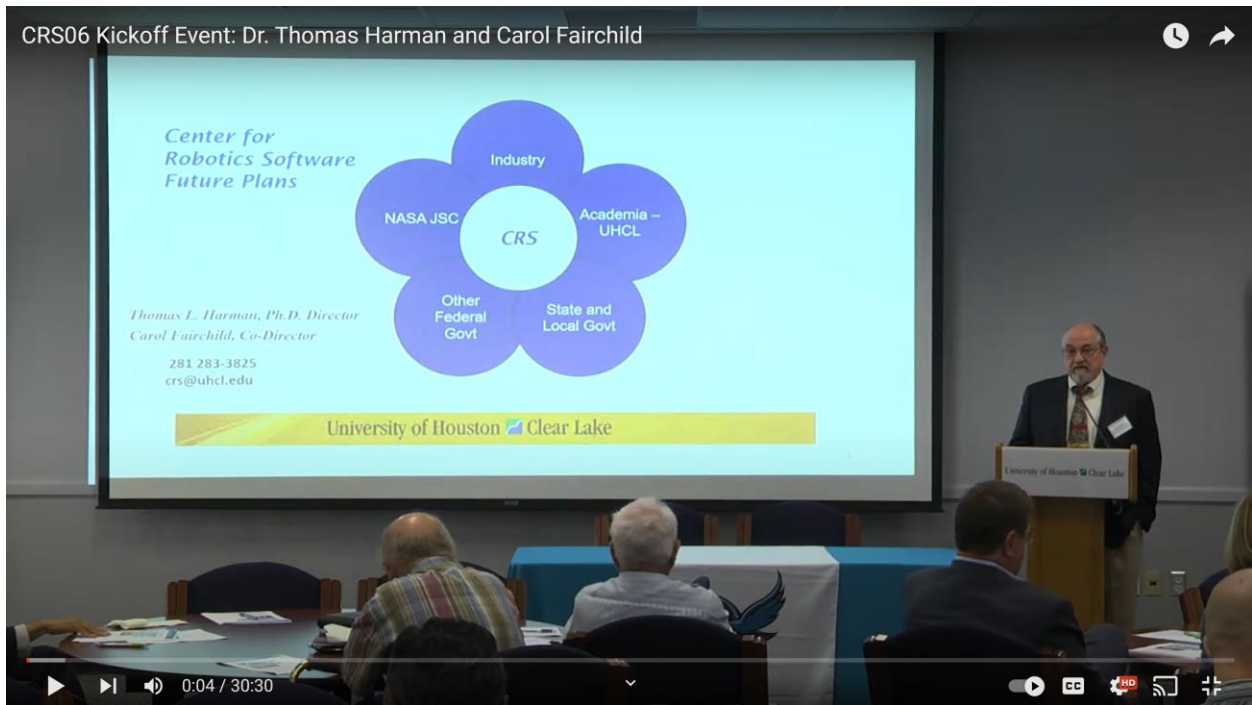


GREAT ROBOTS AT NASA JSC

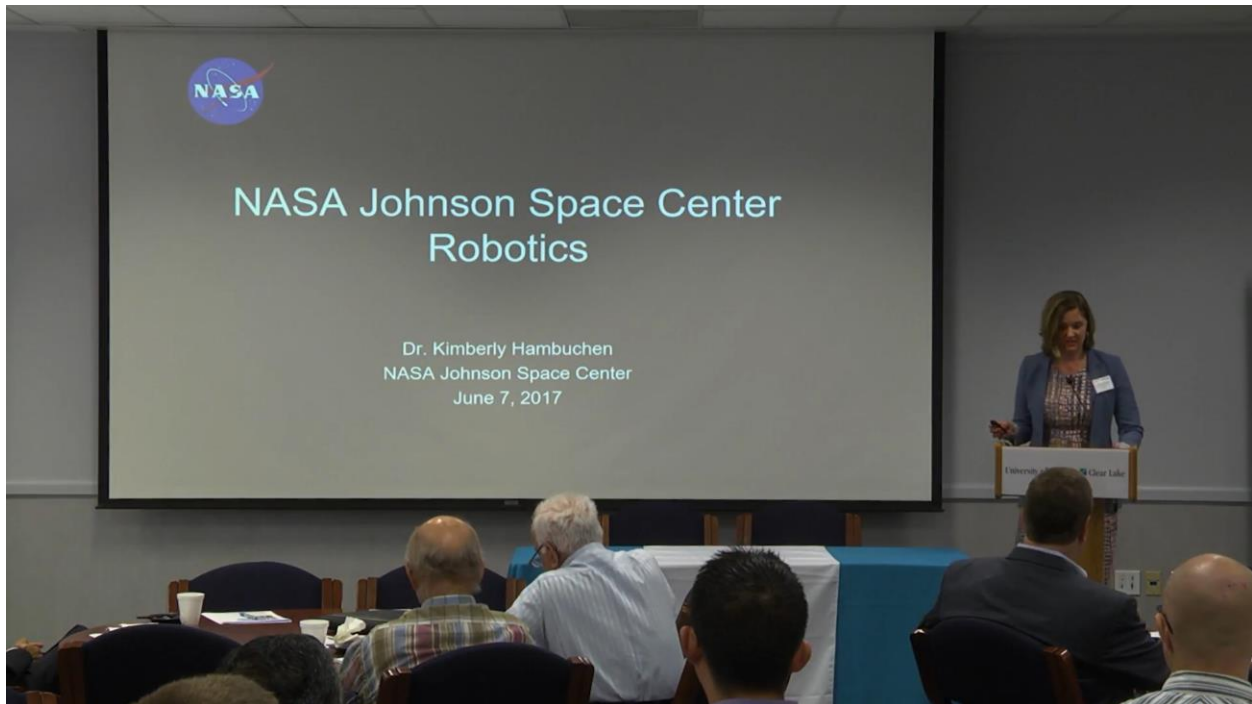
The screenshot displays a video player interface for a ROS World 2021 video archive. The main content is a photograph of a large collection of NASA robots, including humanoid figures, a rover, and a lunar lander, arranged in a museum-like setting. The video player has a black header with the text "Thank you!" in yellow, a NASA logo on the right, and a colorful globe graphic on the left. The "open robotics" logo is in the bottom left corner of the video frame. On the right side of the player, there is a "ROS WORLD 2021" logo at the top, two small video thumbnails below it, and a "Video archive sponsored by ROS Industrial" logo at the bottom. The Windows taskbar is visible at the bottom of the screen, showing the search bar, taskbar icons for File Explorer, Chrome, Outlook, and Word, and system tray icons for weather, network, and volume. The system clock shows 4:12 PM on 8/18/2022.

OUR KICKOFF EVENT

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



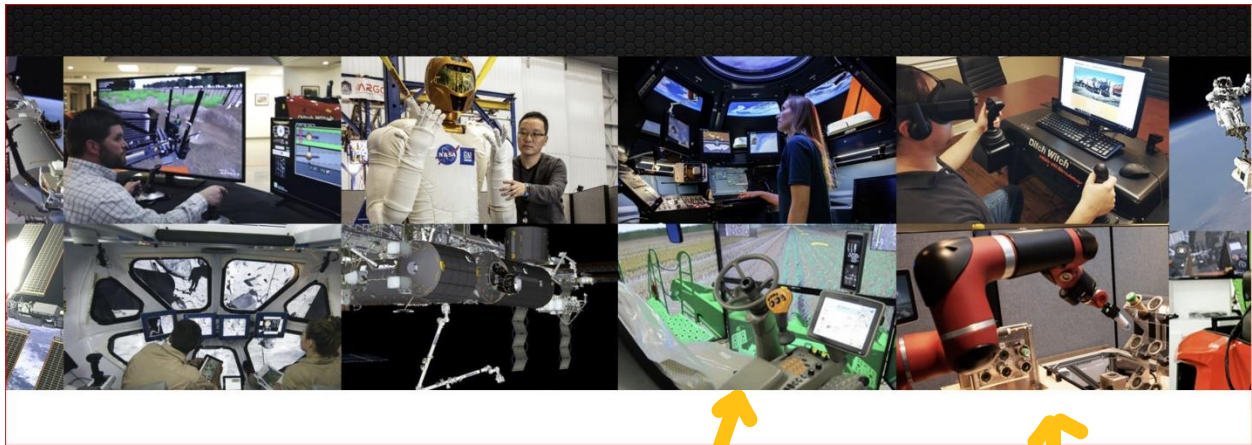
<https://www.youtube.com/watch?v=NZSVpY7GBto&t=13s>



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-sub digest>

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/>

The 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.

[Kavraki Lab at RICE University](#)



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

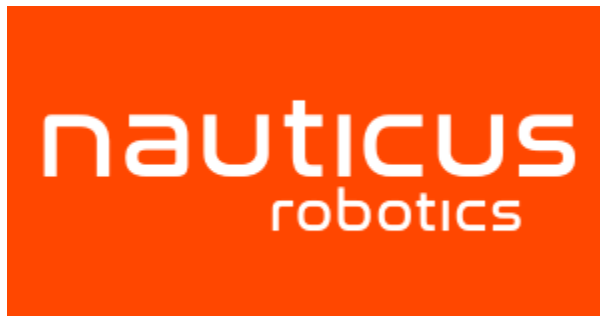


Meet Aquanaut, the Underwater Transformer

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>

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.
