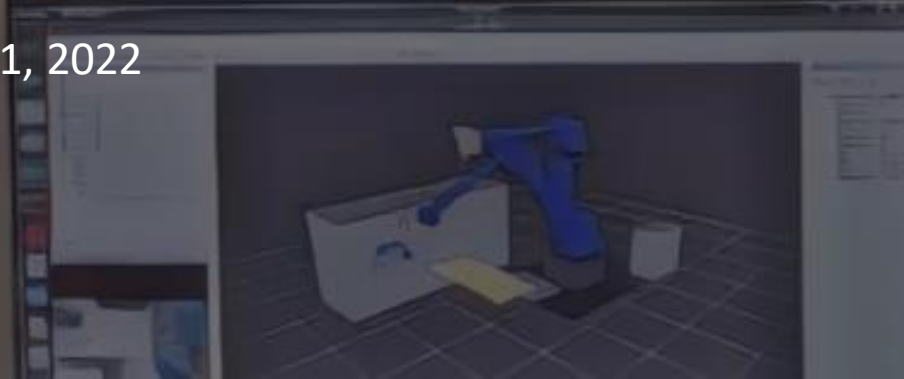




ROS-Industrial Community Meeting

September 21, 2022



Community Meeting Agenda

- What's been going on with ROS-I
- Technical ROS-I Happenings
- Intel RealSense – Updates and New Items
- ConnTact – The why and the latest
- MoveIt & MoveIt Studio!
- Discussion/Q&A
- Adjourn

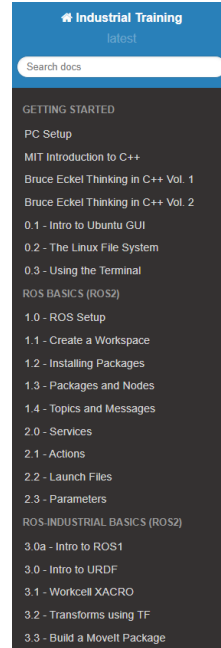
Continue to foster collaboration

- In person conferences, training events, meetups
- Write ups and additional broader reach collaborative initiatives beyond the ROS community
 - Founders' Society of Americas
 - American Welding Society
 - Coaters' Association
 - Remanufacturing Industries Council



Continuous Improvement - Training

- Pilot of Hybrid Training
 - How to make this impactful
 - Engagement with online students
- ROS 2
 - Piloted ROS 2 Labs
 - Back on Hardware
 - For in person
 - Bridge and Porting Exercises
 - New Advanced Topic
 - Motion Planning Pipeline



Industrial Training
latest

Search docs

GETTING STARTED

PC Setup

MIT Introduction to C++

Bruce Eckel Thinking in C++ Vol. 1

Bruce Eckel Thinking in C++ Vol. 2

0.1 - Intro to Ubuntu GUI

0.2 - The Linux File System

0.3 - Using the Terminal

ROS BASICS (ROS2)

1.0 - ROS Setup

1.1 - Create a Workspace

1.2 - Installing Packages

1.3 - Packages and Nodes

1.4 - Topics and Messages

2.0 - Services

2.1 - Actions

2.2 - Launch Files

2.3 - Parameters

ROS INDUSTRIAL BASICS (ROS2)

3.0a - Intro to ROS1

3.0 - Intro to URDF

3.1 - Workcell XACRO

3.2 - Transforms using TF

3.3 - Build a MoveIt Package

Getting Started

Setup

- PC Setup

Prerequisites

C++

- MIT Introduction to C++
- Bruce Eckel Thinking in C++ Vol. 1
- Bruce Eckel Thinking in C++ Vol. 2

Linux Fundamentals

- 0.1 - Intro to Ubuntu GUI
- 0.2 - The Linux File System
- 0.3 - Using the Terminal

Session 1 - ROS Concepts and Fundamentals (ROS2)

[Slides](#)

- 1.0 - ROS Setup
- 1.1 - Create a Workspace
- 1.2 - Installing Packages
- 1.3 - Packages and Nodes
- 1.4 - Topics and Messages

For equivalent ROS1 content, see the [Legacy Material](#) page.

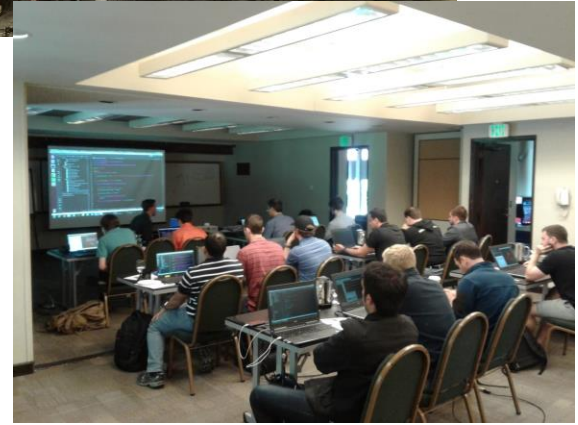
Session 2 - Basic ROS Applications (ROS2)

[Slides](#)

<https://industrial-training-master.readthedocs.io/en/latest/>

Training Moving Forward

- Return of member site-hosted training
 - Analog Devices in Boston!
 - <https://rosindustrial.org/events/2022/10/18/ros-industrial-training-americas-2022-oct>
 - Include welcome dinner & hands on lab
- Additional Advanced Topics
 - Motion Planning Pipeline – Targeting Training event Feb 2023
- Separate Virtual Training



Teaching Application



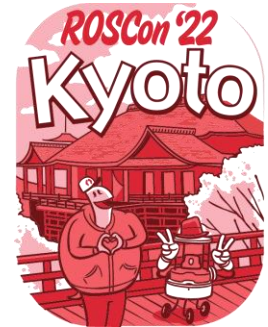
https://github.com/ros-industrial-consortium/scan_n_plan_workshop
Developers' Meeting Overview: <https://youtu.be/GgTxvlaekjE>

Supporting the community

- ROS 2 Technical Steering Committee (TSC)
 - Represent industry/consortium for core ROS 2 topics/roadmap etc
 - Garner support for working groups that are important to industry
- (Hardware) Interfaces Working Group
 - Working group to identify interfaces that include the semantics
 - Identify industrial standards that have good references
 - Open to everyone: <https://discourse.ros.org/t/hardware-interfaces-working-group-recurring-meeting/24847/1>
- World ROS-I Day 2022
 - Focused on ROS 2 Documentation! Submitted 15 PRs to ros2_documentation.

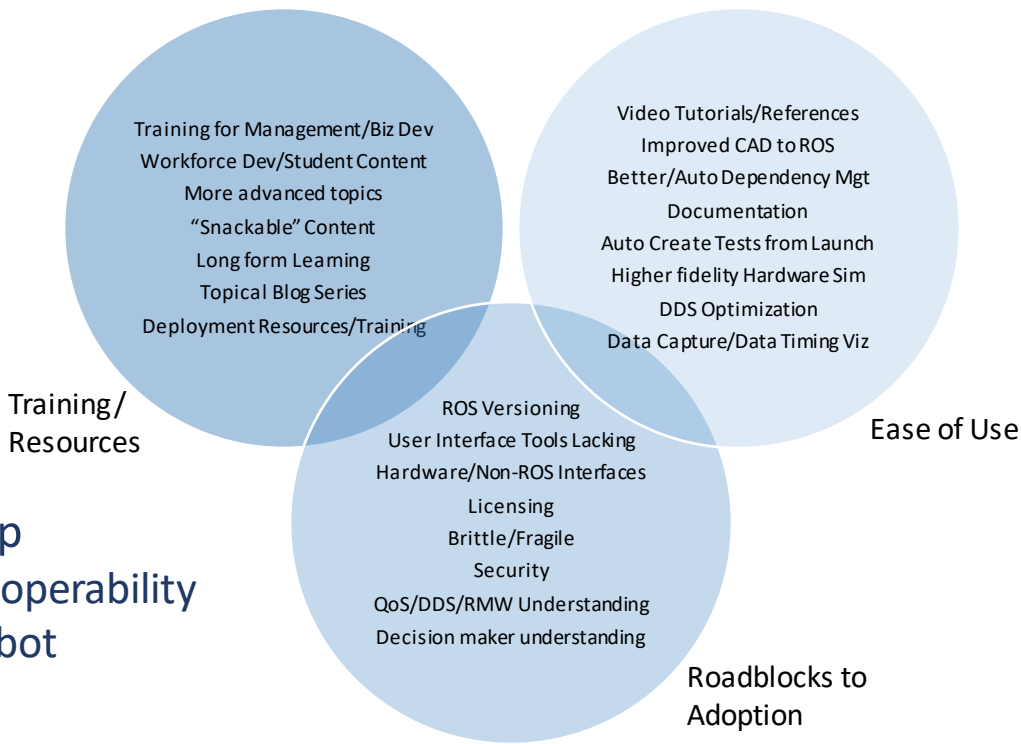
Events on the horizon

- Training
 - October 2022- ROS2/Advanced Topic – Analog Devices, Boston!
 - February 2023- ROS2/Advanced Topic – In Person, San Antonio, TX
- Quarterly Community Meetings – Dec 2022
- [ROSCon](#) – October 19-21, Kyoto Japan
 - ROS-I Exhibiting!
- ROS-I AP [Workshop](#) – November 9-10, Singapore
- ROS-I EU [Conference](#) – December 15-16, Stuttgart
- 2023 Annual Meeting – targeting co-located with Automate, Detroit



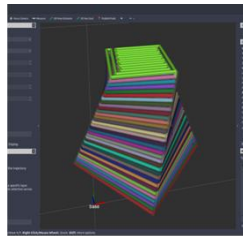
Shaping a Roadmap - Feedback

- Workshops over last handful of years providing feedback
- Long list of challenges
 - Developers
 - Decision Makers
 - Mfg Engineers
 - Tech Stewards
- Feedback on various areas
- Affinitize and update roadmap
 - Capture ROS 2/Version/Interoperability
 - Reference back to roles in robot ecosystem

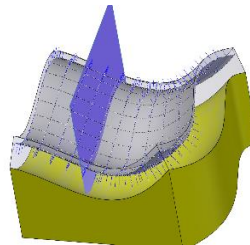


Defining Collaboration Opportunities

- Robotic Blending – Champion by SFSA – targeting low lot, no tooling surface finishing
- Open Framework for Additive Manufacturing – Champion – Pending – Flexible agile framework to support more capable applications
- ROS Workbench – Now called “SWORD” to enable manufacturing engineers to set up systems, interact with tool path planning and visualize certain classes of motion plans.



ROS Additive Manufacturing Package
http://wiki.ros.org/ros_additive_manufacturing

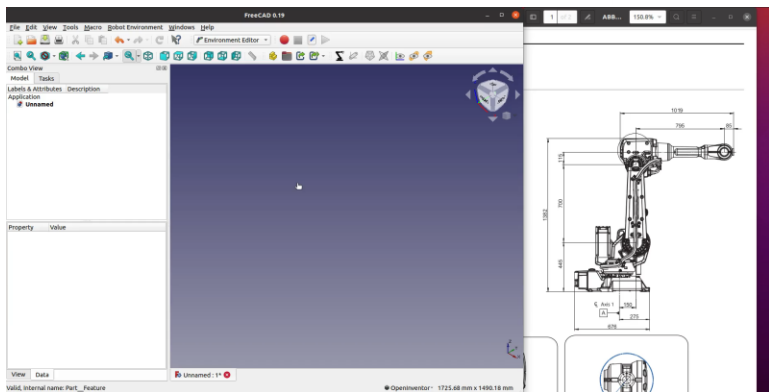


Algorithms to adapt path plans to perceived environments/contours



Aligned with External Voice

PDIR – ROS Workbench

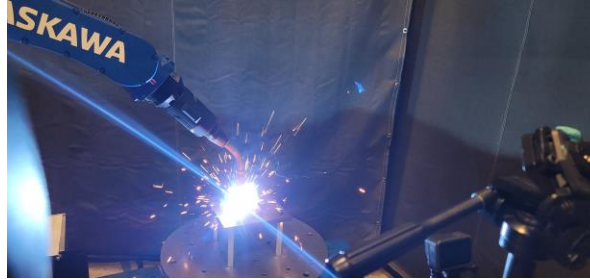
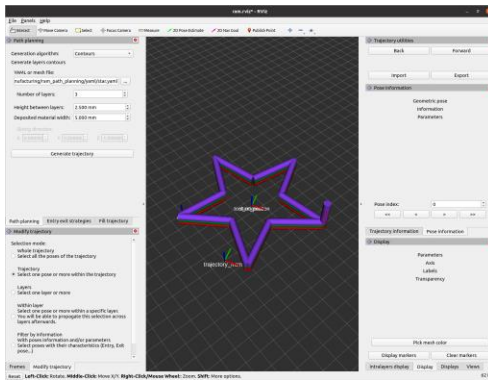


Starting Beta Testing with ROS-I Members



Open Additive Framework

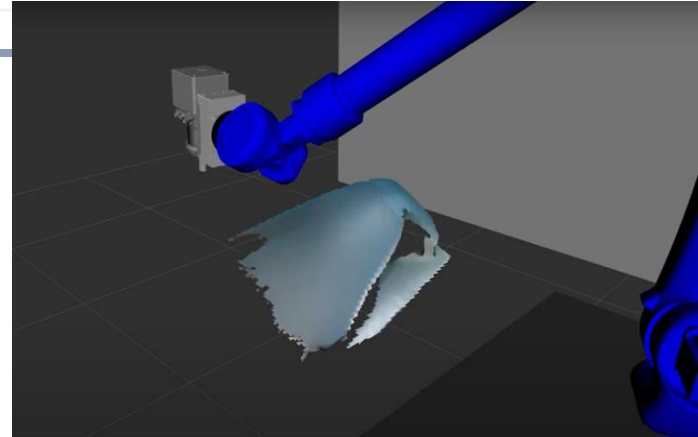
- Open Flexible Additive Framework
- Merging of computational physics-based analysis with planning



<https://youtu.be/rxkLyYaazII>

Thank You!

- Provide feedback
- Seek out ways to collaborate
- Engage your supplier/partners on ROS use
- Reach out if you need help

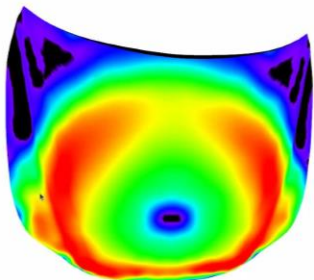


ROS-Industrial Technical Updates

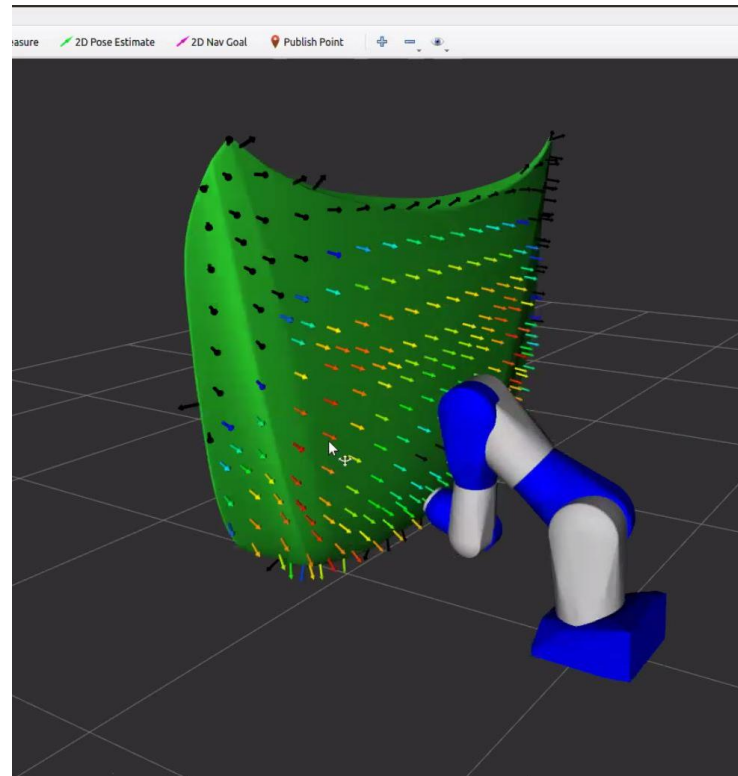
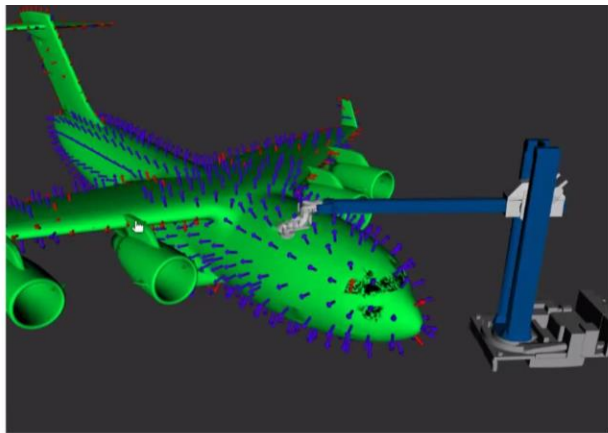
- Michael Ripperger – ROS-I Americas Technical Lead
 - Reach - <https://github.com/ros-industrial/reach>
 - What is Reach
 - Recent Updates and Upcoming

Updates on the Reach Repository - The REACH

repository is a tool that allows users to visualize and quantitatively evaluate the reach capability of a robot system for a given workpiece. See the ROSCon 2019 [presentation](#) and [video](#) for a more detailed explanation of the reach study concept and approach.



Heat map for reachability – coming!



Heat map scoring of waypoints on a mesh – pose quality – new metrics! – available now!

<https://github.com/ros-industrial/reach>

Resources for the Community

- ROS-Industrial
 - Home: rosindustrial.org
 - Documentation: wiki.ros.org/industrial
 - Code: <https://github.com/ros-industrial>;
<https://github.com/ros-industrial-consortium>
 - Training: http://ros-industrial.github.io/industrial_training/
 - ROSin: <http://rosin-project.eu/>
- Upcoming Events (<https://rosindustrial.org/events-summary/>)