ROS-INDUSTRIAL: UPDATES FROM ROS-INDUSTRIAL CONSORTIUM EUROPE

ROS-Industrial Asia Pacific Workshop 2019, Singapore

Harsh Deshpande – Research Associate
Fraunhofer IPA

Technology consultant and innovation driver since 1959

- Operational budget of 70.8 million euros
- 25.8 million euros in industrial revenues
- More than 1,000 employees

New technical center “Gebäude D” in Stuttgart

Note: key figures for 2016; IPA Stuttgart including locations in Rostock, Mannheim, Bayreuth and Vienna
Current focus: robots as the “tool of tomorrow” for personalized production

Are “points of sales” in robotics shifting?

Megatrend Industrie4.0

Why does HRC catch on so slowly?

Sensors as part of the robot offering?

Do gripper/tools become part of the portfolio?

Intuitive programming, exception handling

What about Open Source?

Cognition and Machine Learning

Source: video.smerobotics.org, “SMERobotics in 100 seconds”
ROS-Industrial Consortia

**Goals:**

- Provide a financial support to ROS-Industrial activities
- Multiply “local” activities to increase ROS-Industrial influence
- Build/Manage the community around ROS-Industrial

- ROS-I North America, SwRI (TX, USA)
- ROS-I Europe, Fraunhofer IPA (Germany)
- ROS-I Asia Pacific, A*Star (Singapore)
ROS-Industrial Consortium

Over 60 organizations supporting ROS-Industrial (March 2019)
What is Horizon2020 EU-project ROSIN supports EU’s strong role within ROS-Industrial
Fostering Europe’s expertise in advanced manufacturing,

4-years, ~8 million EUR funding (01.01.2017 – 31.12.2020)

- Builds upon what exists; sustainable results after its completion
- Key actions to make ROS better, business friendlier, more accessible
- (Extra goal) cluster other publicly funded activities using ROS like RobMoSys, OFERA, or SeRoNet

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Key actions to make ROS:

**better**

Software Quality

ROS-I best practices and tools: continuous integration, unit testing, code reviews

ROSIN further improves on them with code scanning, automated test generation, model-in-the-loop testing

[rosin-project.eu/software-quality-assurance](rosin-project.eu/software-quality-assurance)

**business friendlier**

New components + path for exploitation

3.5 Million € available to third parties for ROS-Industrial development

Develop missing components or improve existing ones

Commercial release template (licensing, etc)

[rosin-project.eu/ftps](rosin-project.eu/ftps)

**more accessible**

Education

Educate students: summer schools

Train professionals: ROS-I academy

Open Call to fund your ROS education initiative

[rosin-project.eu/education](rosin-project.eu/education)
Better via Software Quality Assurance

- Quality as a culture
- Better structuring of development process
- Code scanning techniques
- Testing methodologies
- Model-driven development
- rosin-project.eu/software-quality-assurance
- E.g. Rosinstall Generator Time Machine
- http://rosin-project.eu/consortium-results

**ROS Software Quality Hub**

- http://wiki.ros.org/Quality
- Discuss issues of quality policies in ROS
- https://discourse.ros.org/c/quality

Accessible via Training and education

**ROS-Industrial (Summer) School** for students
- at FH Aachen in Germany
- **ROS Academy in 2019** w/ SI & OEMs
- 5x at Fraunhofer IPA, Germany
- 3x at RoboHouse, Netherlands
- at external partners (trained trainers)
- **Technical Workshops** (Spring/Fall) more detailed
  - Spring edition: May 6-7 on ROS2 & DDS
  - Fall edition: October 9-10 (MoveIt2?)
- **MOOC: Hello (Real) World with ROS**
  - online-learning.tudelft.nl/courses/hello-real-world-with-ros-robot-operating-systems/
- **Networking / Market**
- via discourse.ros.org/c/jobs
Business friendlier via FTPs

- **Focused Technical Projects (FTPs)**
  - funding for 1/3 of SW dev cost

- **In total 3.5 million EUR EU-funding**

- **Quarterly cut-off dates**
  - (next: June 14 & September 13, 2019)

- **So far 39 FTPs granted**
  - (most are still running)

- **(Intermediate) results online**

- **rosin-project.eu/results**

- **About half of budget spent**
  - → more to come!
Upcoming FTP highlights

- **ROS2 Integration Service w/ ePROSIMA (by end 2019)**
  - Integration: Connect ROS2 to other protocols (MQTT, zeroMQ, a file/DB, etc): offer a common framework, standard interfaces, and useful services to create general Bridges & transformations.
  - Routing: Enable ROS2 over Internet/WAN. Currently, ROS2 just allow LAN comms because of underlying protocol of ROS2: offer routing services for ROS2 traffic in several scenarios.

- **Universal Robots ROS-Industrial Driver w/ UR (by mid 2019)**
  - high performing, stable and sustainable interface between UR robots and ROS enable all robot features that can be exploited within the current ROS Industrial driver paradigm

- **roScan w/ BOSCH Engineering (by end 2019)**
  - Clarification of license terms and conditions for ROS itself or functional ROS-packages. Bosch Engineering GmbH will perform the open source scanning (OSS) of the whole ROS core software and main mobile robotics functional packages, analyses the results and prepare a referable source of their license terms and conditions.
Success stories
Pilz Robot

Pilz ROS Module

Open Source Driver made by Pilz
- MoveIt! config with ikfast plugin
- Gazebo simulation
- Trajectory Generation for standard cartesian paths

Open-source: [https://github.com/PilzDE/pilz_robot](https://github.com/PilzDE/pilz_robot)
Proprietary ROS module: Buy it from Pilz

[https://youtu.be/CSKySVEsu8A](https://youtu.be/CSKySVEsu8A)
ROS-Industrial Next Events:

- ROS-Industrial (EU) Trainings:
  - June 24 – 26, 2019 (@Fraunhofer IPA - Sold Out)
  - September 23 - 27, 2019 (@Fraunhofer IPA)
  - November 18 – 22, 2019 (@Fraunhofer IPA)

- ROS-Industrial (EU) Workshops:
  - October 9 – 10, 2019 (@Fraunhofer IPA)

- Worldwide Events (hosted at multiple location including IPA):
  - World ROS-I Day (July 2nd)
  - World MoveIt! Day (November?)

- ROS-Industrial Conference (Dec 10 - 12, 2019 @Stuttgart)
Your point of contact

OpenSourceRobotics@ipa.fraunhofer.de

Fraunhofer IPA
Nobelstr. 12
70569 Stuttgart
Germany

rosin-project.eu
rosindustrial.org
ipa.fraunhofer.de/en