



EU project ROSIN: Change in free robot software components

New open-source ROS libraries and tools to develop more advanced robot applications, as well as methods for quality assurance for their industrial use: After almost 3 years, ROSIN reflects on its achievements and next goals. Working on automated software quality testing algorithms, supporting further technical and educational projects and enlarging the EU ROS-Industrial community and support it in the transition to ROS2 are in the spotlight.

Not even terminated and ROSIN has already provided results that are applicable in industry: Out of 60 supported “Focused Technical Projects” (FTPs), more than 30 already resulted in new open source ROS packages. Packages cover among others (3D) perception, motion planning and navigation. One example is the GitHub repository of the traditional automation company in safety Pilz that offers also a new industrial robot arm manipulator that runs on ROS. With this FTP, the company implemented a trajectory generator with a MoveIt-interface for easy planning and execution of Cartesian standard-paths (LIN, PTP, CIRC). In addition, the blending of multiple sequential motion commands was realized. Vision4UAV released Aerostack, a framework for building autonomous aerial systems. Another highlight: Universal Robots developed a new interface between UR robots and ROS for its new e-Series robots.

Other FTPs support the transition from ROS components to the new ROS 2 version, the latter using the “Data Distribution Service” standard for real-time systems. One of these FTPs relies on the model-driven approach from the EU sister project RobMoSys. “We are very pleased with the variety of projects we have been able to support. Several examples already show that ROS is gaining more and more relevance in industrial applications”, says Dr. Carlos Hernandez, project coordinator from Delft University of Technology.

Three successful cornerstones

The project does not only focus on the development of new software but also on improving existing components. To increase the quality of ROS and its relevant packages ROSIN released tools for a sufficient quality assurance. Among them are solutions contributing to the code scanning approach. Hundreds of ROS packages have already been scanned for several kinds of bugs and security issues, and more than a dozen previously unknown bugs have been reported. Also, community oriented quality assurance tools are being deployed. There are new sections in the ROS wiki devoted to quality, and extensions reporting the package health and use of testing, so that users can more easily assess the status of a given package.

In addition, the third cornerstone of the project –knowledge transfer and training of future ROS users and experts– is going well, too. Based on the high request, plans to support third parties with educational measures about ROS have been accelerated. In total, 14 professional trainings and all designated schooling activities have been conducted since ROSIN started. “You also might want to save the date for our second run of the first massive open online course (MOOC) starting January 2020. It provides learners with the fundamentals about ROS to create robot systems, and is made for beginners”, states Dr. Hernandez, who will also be one of the instructors.

Reach critical mass

ROSIN will continue to bring advanced abilities to industrial applicability by moving the global ROS-Industrial framework significantly beyond the state-of-the-art: Concerning quality assurance, ROSIN will develop novel automated software quality testing algorithms. ROS-based and -enabled robot



abilities are planned to become a widely adopted standard. The goal of increasing the ROS-Industrial community amongst industrial users is already taking off: The positive effect is quickly expanding from the field of industrial robots into the rapidly growing markets of agro robotics, health care robotics, and other types of service robotics. Latest updates about many ROS topics offers the project's flagship event ROS-Industrial Conference 2019. It takes place from December 10-12 in Stuttgart, Germany.

About ROSIN:

ROSIN works on the availability of high quality, intelligent robot software components for the European industry based on the open-source robot operating system ROS. To spread the open-source system in industrial settings, ROSIN makes 50% of their budget available to European industrial users and developers. It finances so called Focused Technical Projects to support the development of freely available ROS packages while developing ROS-focused Quality Assurance Methods including automated code quality testing.

Partners: Delft University of Technology (The Netherlands, coordinator), Fraunhofer Institute for Manufacturing Engineering and Automation IPA (Germany), IT University of Copenhagen (Denmark), Fachhochschule Aachen University of Applied Sciences (Germany), Fundacion Tecnalia Research and Innovation (Spain), ABB AB (Sweden).

Duration: January 1st 2017 to December 31st 2020

Contact Persons: Dr. Carlos Hernandez Corbato – TU Delft;
c.h.corbato@tudelft.nl; +31 15 27 88643

Thilo Zimmermann – Fraunhofer IPA;
thilo.zimmermann@ipa.fraunhofer.de; +49 711 970 1240

Webpage: <https://rosin-project.eu>

ROSIN project is funded by the European Union's Horizon 2020 research and innovation program under grant agreement no. 732287.

Flagship Event:

December 10-12, 2019, Germany: ROS-Industrial Conference 2019; three days with a variety of technical and non-technical talks about ROS & ROSIN, unique chance for networking. All information here: <https://rosindustrial.org/events/2019/12/10/ros-industrial-conference-2019>

There are continuously ongoing events for education and training with ROS. Please check <https://rosin-project.eu/events> for an event that fits your preferred time and place.

Picture material:

Caption: A robot cell developed within ROSIN showing a Scan-N-Plan setup—tools that enable real-time robot trajectory planning from 3D scan data. The cell was realized with components from the traditional automation company in safety Pilz that is getting into robotics with ROS and ROSIN. The application also integrates results of another application developed in an FTP, in which an Ensenso camera driver was developed. Image credit: Fraunhofer IPA.

