



7th ROS-Industrial Conference
Stuttgart, Germany (EU)
rosindustrial.org/riceu2019



Commercial exploitation with ROS-Industrial and Introduction into FTP session

Jon Azpiazu, Tecnalia

ROSIN Project

www.rosin-project.eu

4 years, ~8 million EUR



IT UNIVERSITY OF COPENHAGEN



- Speed-up the industrial uptake of advanced robotics applications in EU
- Robot Operating System (**ROS**) for an open-source **EU Digital Industrial Platform for Robotics**
- ROS-Industrial Europe community: self-sustaining and **leading** world-wide

3+ Million EUR funding

- For ROS-I devel. and education.
- 4 calls a year:

Nov 16



Software Quality Assurance

- Community involvement
- Continuous Integration
- Code scanning
- Model-in-the loop



Package Summary			
Released	Continuous Integration: 52 / 52	Documented	
The actionlib tasks. Example: scan and return			
• Maintained	#14 29-Apr-2019 06:16	52 / 52	or interfacing
• Maintained	#13 27-Apr-2019 18:10	52 / 52	target location
• Maintained	#12 17-Apr-2019 15:10	52 / 52	the handle c
• Maintained	#11 14-Mar-2019 19:10	52 / 52	validation DOT
• License	#10 09-Feb-2019 22:06	52 / 52	
• Bug / feature tracker: https://github.com/ros/actionlib/issues			
• Source: git https://github.com/ros/actionlib.git (branch: indro			

ROS Education

- Academy for professionals
- School for students



This project has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement no. 732287.



FOCUSED TECHNICAL PROJECTS

What service?

- Finance ROS open source development
 - Concrete industry need:
driver, algorithm, application template, license or code audits...
 - We fund 1/3 of the development efforts
 - Up to **EUR 100K** ~ 1 year duration

Who can benefit?

- Robot software **developers** and **users**: companies, research centers...
 - EU H2020 program eligible entities (small consortiums)

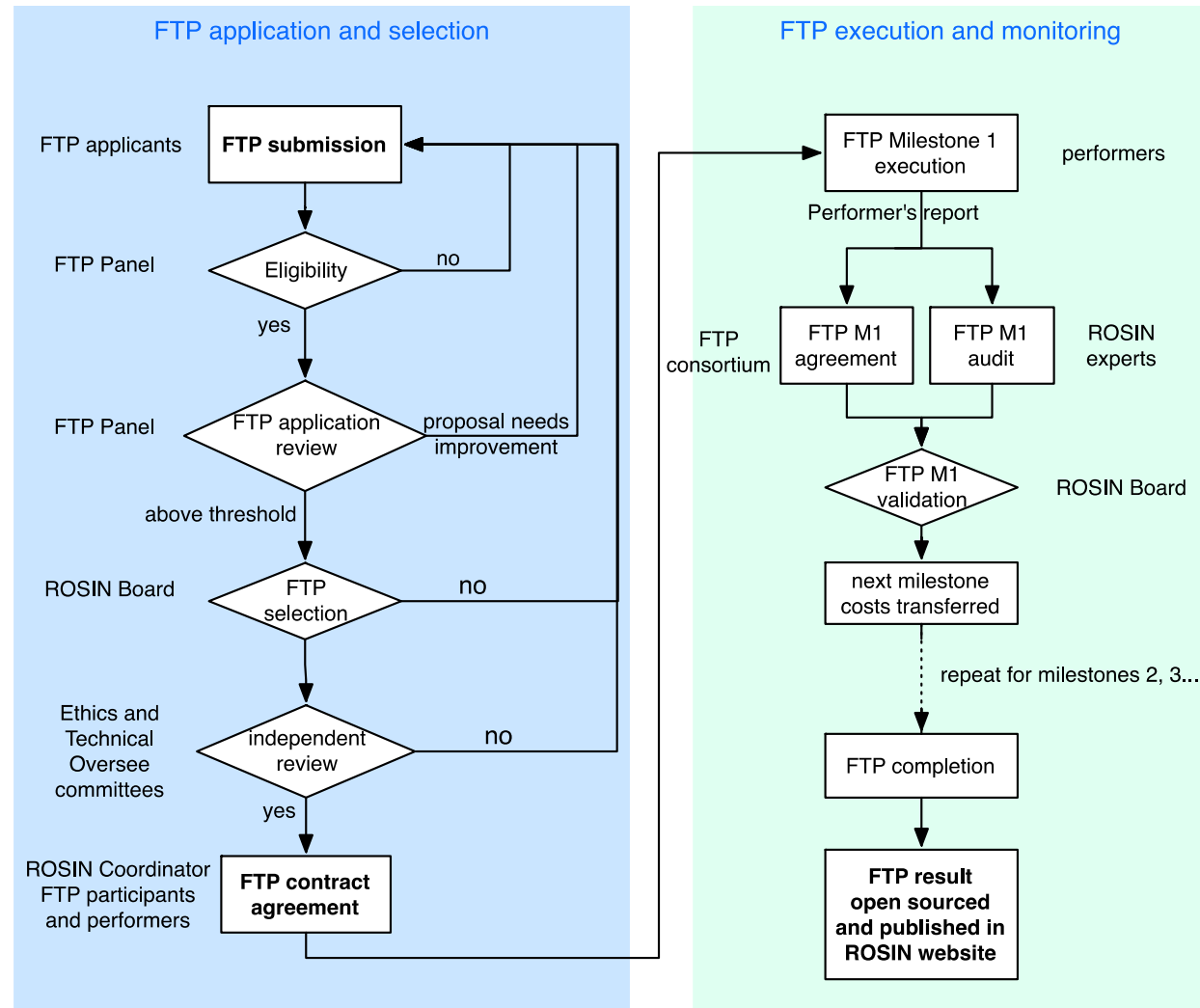
How to apply?

- 4 selection cut-offs per year <http://rosin-project.eu/ftps>
- Simple application template (~5 pages):
 - What / How / Proof of commitment

FTP selection process

Open call
Submit any
time
<http://rosin-project.eu/ftp>

**ROSIN pays
60% of MI**



**ROSIN pays
remaining
40% of MI**

Evaluation criteria

	Criteria (0 to 5)	Min.	Weight
1	Does it contribute to ROS-Industrial Europe?	3	30%
2	Impact	-	10%
3	Market	-	10%
4	Technology	-	10%
5	Team	3	20%
6	Work implementation	3	20%
	Overall score	-	

ROSIN FTP Contract

- TU Delft financially responsible as ROSIN Coordinator.
- Obligation by the applicants to execute the development planned in the FTP in time, specifically **Milestone I**.
- Milestones and payment schema.
- **Lump sum** schema for costs.
- The FTP results need to be open source under appropriate **open-source** license.
 - **Apache 2.0** license recommended
 - Business friendly, standard in ROS-industrial community.
 - Background IP defined.

ROSIN Monitoring

- Milestone I report for applicants
 - Template focusing on QA aspects
 - Evaluated by ROSIN experts
- ROSIN Monitoring workgroup (Tecnalia, TUD, ITU):
 - ROSIN support upon FTP request
 - QA monitoring of FTPs
 - Adopters ROSIN QA tools
 - One to one
 - Joint workshop with several FTPs

Coverage report

Coverage report: 84%

Module	statements	missing	excluded	coverage
RoboticsLanguage/Base/CommandLine.py	134	10	0	93%
RoboticsLanguage/Base/DefaultParameters.py	4	0	0	100%
RoboticsLanguage/Base/Dictionary.py	6	6	0	0%
RoboticsLanguage/Base/Inputs.py	9	9	0	0%
RoboticsLanguage/Base/Localisation.py	6	6	0	0%
RoboticsLanguage/Base/Outputs.py	6	6	0	0%
RoboticsLanguage/Base/Transformations.py	22	0	0	100%
RoboticsLanguage/Base/Utilities.py	185	11	0	94%
RoboticsLanguage/Base/_init_.py	0	0	0	100%
RoboticsLanguage/Inputs/RoL/Parameters.py	3	0	0	100%
RoboticsLanguage/Inputs/RoL/Parse.py	142	7	0	95%
RoboticsLanguage/Inputs/RoL/_init_.py	0	0	0	100%
RoboticsLanguage/Inputs/RoLXML/Parameters.py	3	0	0	100%
RoboticsLanguage/Inputs/RoLXML/Parse.py	7	0	0	100%
RoboticsLanguage/Inputs/RoLXML/_init_.py	0	0	0	100%
RoboticsLanguage/Inputs/_init_.py	0	0	0	100%
RoboticsLanguage/Outputs/HTMLDocumentation/Output.py	5	5	0	0%
RoboticsLanguage/Outputs/HTMLDocumentation/Parameters.py	3	0	0	100%
RoboticsLanguage/Outputs/HTMLDocumentation/_init_.py	0	0	0	100%
RoboticsLanguage/Outputs/HTMLGUI/Output.py	5	5	0	0%
RoboticsLanguage/Outputs/HTMLGUI/Parameters.py	3	0	0	100%
RoboticsLanguage/Outputs/HTMLGUI/_init_.py	0	0	0	100%
RoboticsLanguage/Outputs/RoL/Output.py	5	5	0	0%
RoboticsLanguage/Outputs/RoL/Parameters.py	3	0	0	100%
RoboticsLanguage/Outputs/RoL/_init_.py	0	0	0	100%
RoboticsLanguage/Outputs/RoLXML/Output.py	17	17	0	0%
RoboticsLanguage/Outputs/RoLXML/Parameters.py	3	0	0	100%
RoboticsLanguage/Outputs/RoLXML/_init_.py	0	0	0	100%
RoboticsLanguage/Outputs/RosCpp/Output.py	24	24	0	0%
RoboticsLanguage/Outputs/RosCpp/Parameters.py	3	0	0	100%
RoboticsLanguage/Outputs/RosCpp/_init_.py	0	0	0	100%
RoboticsLanguage/Outputs/_init_.py	0	0	0	100%
RoboticsLanguage/Scripts/tests/test_base_commandline.py	29	1	0	97%
RoboticsLanguage/Scripts/tests/test_base_transformations.py	10	1	0	90%
RoboticsLanguage/Scripts/tests/test_base_utilities.py	131	5	0	96%
RoboticsLanguage/Scripts/tests/test_roL_parse.py	44	1	0	98%
RoboticsLanguage/Transformers/Base/Language.py	1	0	0	100%

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E.g. Coverage report by “Robotics Language”

Scope of FTPs

- ROS (I) and ROS2.0




- **HW-related components,**
- **ROS Enhancement Proposals (REPs):**
- **algorithms:** e.g., a SLAM algorithm
- **application templates,**
- **improvement of existing components**
- **process-related work,** e.g. code security audits.
- **improvement of documentation**
- **integration with other software frameworks**
- ...

FTP RESULTS

<http://rosin-project.eu/results>


DRIVERS & APPLICATIONS




ROS
IMC drives interface

IMC drives

Champion Beta Robots, Spain

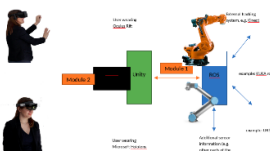


AEROSTACK 3.0



AEROSTACK 3.0: Aerial robotics framework for the industry

Champion Universidad Politecnica de Madrid, Spain
<https://github.com/vision4uav/aero>



Rvis2AR

Champion Awesome Technologies Innovationslabor GmbH, Spain

ARViz: Augmented Reality Visualizer for ROS2

Champion Robotics Group of Rey Juan Carlos University, Spain



Rosbobo


ROsBOBO

Champion MANUFACTURA DE INGENIOS TECNOLOGICOS SL, Spain



ZIVID-ROS

Champion Zivid Labs, Norway



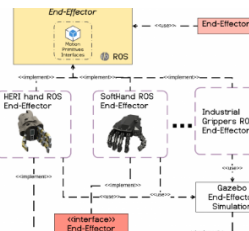
Visard4ROS – Easy to use 3D vision for robots

Champion Roboception, Germany
http://wiki.ros.org/rc_visard



Ensenso-ROSif

Champion Ensenso GmbH, Germany
http://wiki.ros.org/ensenso_driver



ROS End-Effector

Champion Istituto Italiano di Tecnologia, Italy

Universal Robots ROS-Industrial Driver

Champion Universal Robots A/S, Denmark

ROBIN

Champion INESC TEC, Portugal

ROS2 Integration Service

Champion eProsim - Proyectos y Sistemas de Mantenimiento SL, Spain



HRIM: The Hardware Robot Information Model

Champion Erle Robotics S.L., Spain
<https://github.com/erlerobot/HRIM>

ROS Control

Champion PAL Robotics S.L., Spain

ANDROS

Champion StreamOwl, Greece

MOVE-RT

Champion University of Bologna, Italy

ROS2AR

Champion UTCN, Romania

FTP RESULTS

<http://rosin-project.eu/results>


TOOLS



Robotics Language

Champion Robot Care Systems, Netherland

<https://github.com/robotcaresystem>



Prognostics and Health Management Tool for ROS

Champion Inovasyon Muhendislik Ltd. Sti., Turkey

roScan

Champion Bosch Engineering GmbH, Germany

CalibROS-FTX: Robot supported calibration of F/T sensors

Champion ME-Meßsysteme GmbH, Germany



RedROS-I

Champion ALIAS ROBOTICS, Spain

RedROS2-I

Champion ALIAS ROBOTICS, Spain

ROS-MDD

Champion CEA LIST, France



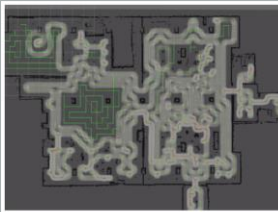
PAL ROBOTICS

Statistics Framework

Champion PAL Robotics, Spain


https://github.com/pal-robotics/pal_statistics

ALGORITHMS



Coverage Path Planning and Control

Champion Noble Projects BV, Netherland



ROS industrial indoor positioning system

Champion Inovasyon Muhendislik Ltd Sti., Turkey

https://github.com/inomuh/indoor_

ROBUST AND RELIABLE GPS-FREE LOCALIZATION ALGORITHM FOR AERIAL ROBOTS APPLIED TO INDUSTRIAL APPLICATIONS

Champion Advanced Center For Aerospace Technologies (FADA-CATEC), Spain



ROSdyn

Champion CNR-ITIA, Italy



Industrial trajectory generation for MoveIt!


Champion Pilz GmbH & Co. KG, Germany

rcreason4ROS

Champion Roboception GmbH, Germany

AGROSBUS

Champion Università Politecnica delle Marche, Italy



ROS weld

ROSWELD – ROS based framework for planning, monitoring and control of multi-pass robot welding

Champion PPM AS, Norway



Pattern Manager

Champion Danish Technological Institute, Denmark

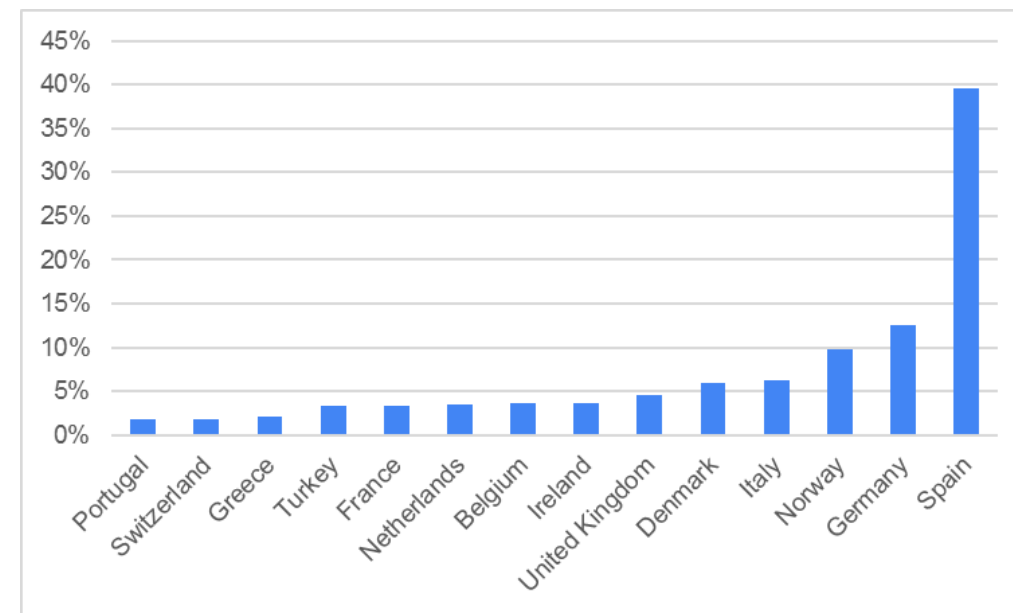
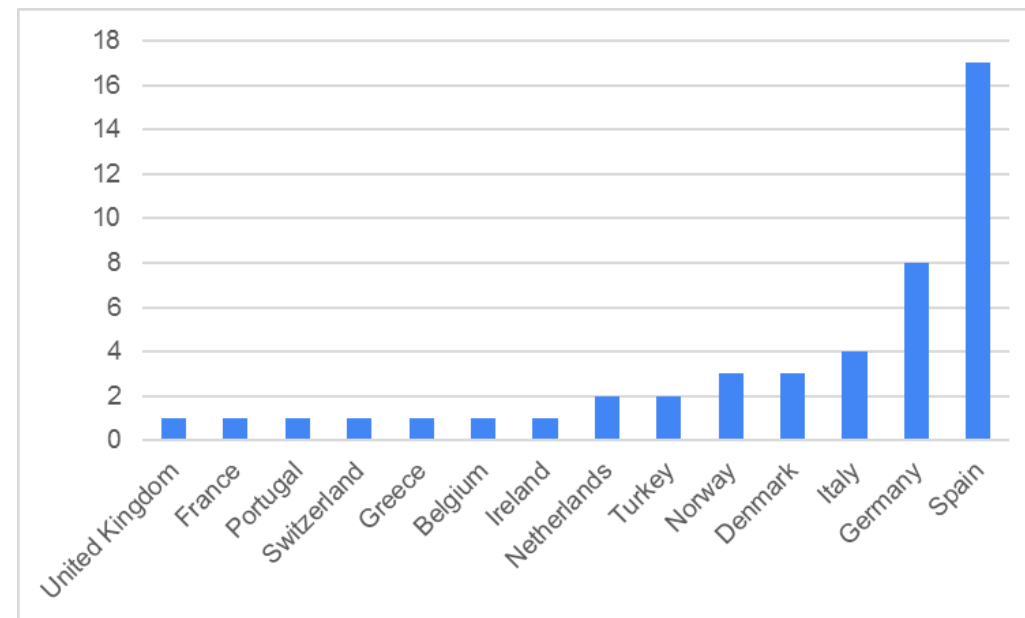
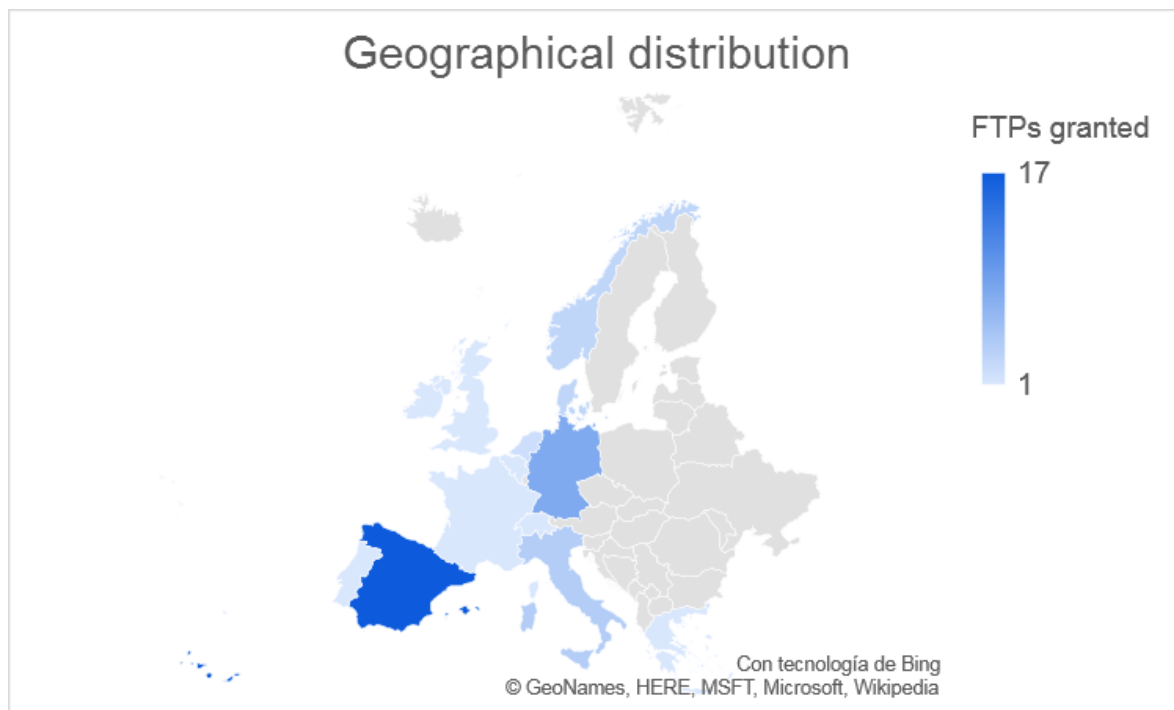
Cross-platform ROS simulation for mobile manipulators

Champion Cyberbotics S.à r.l., Switzerland

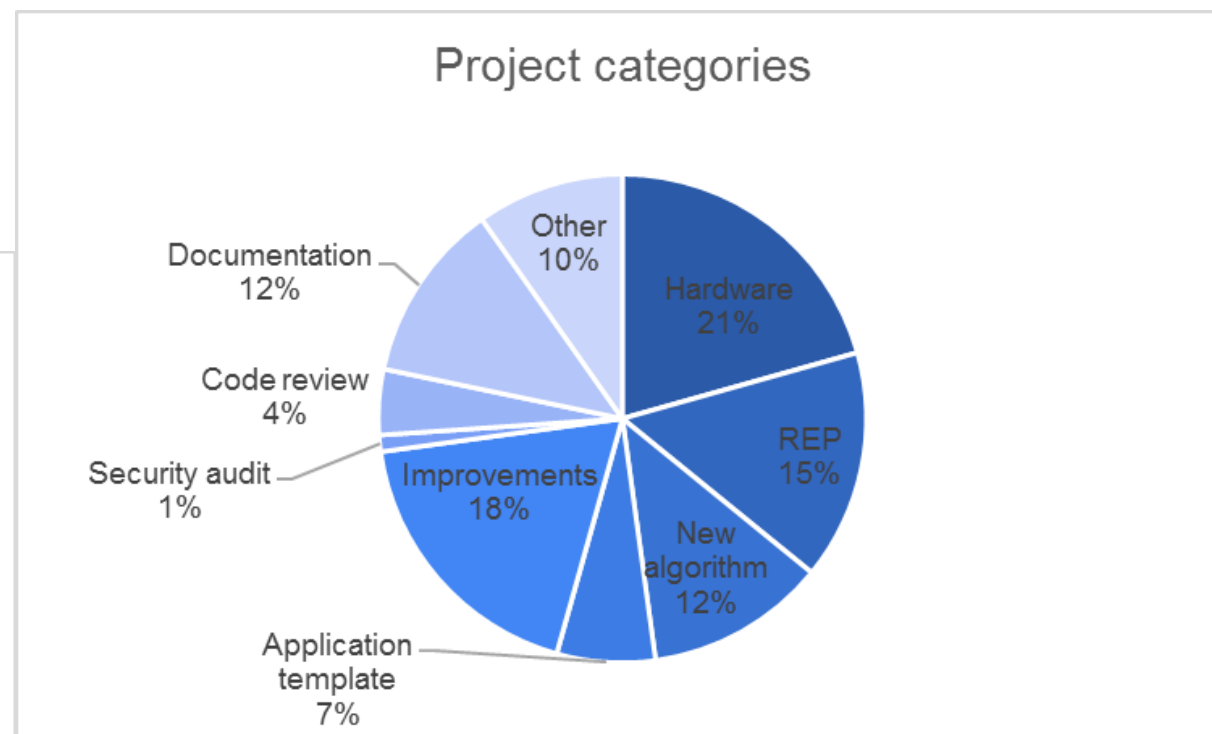
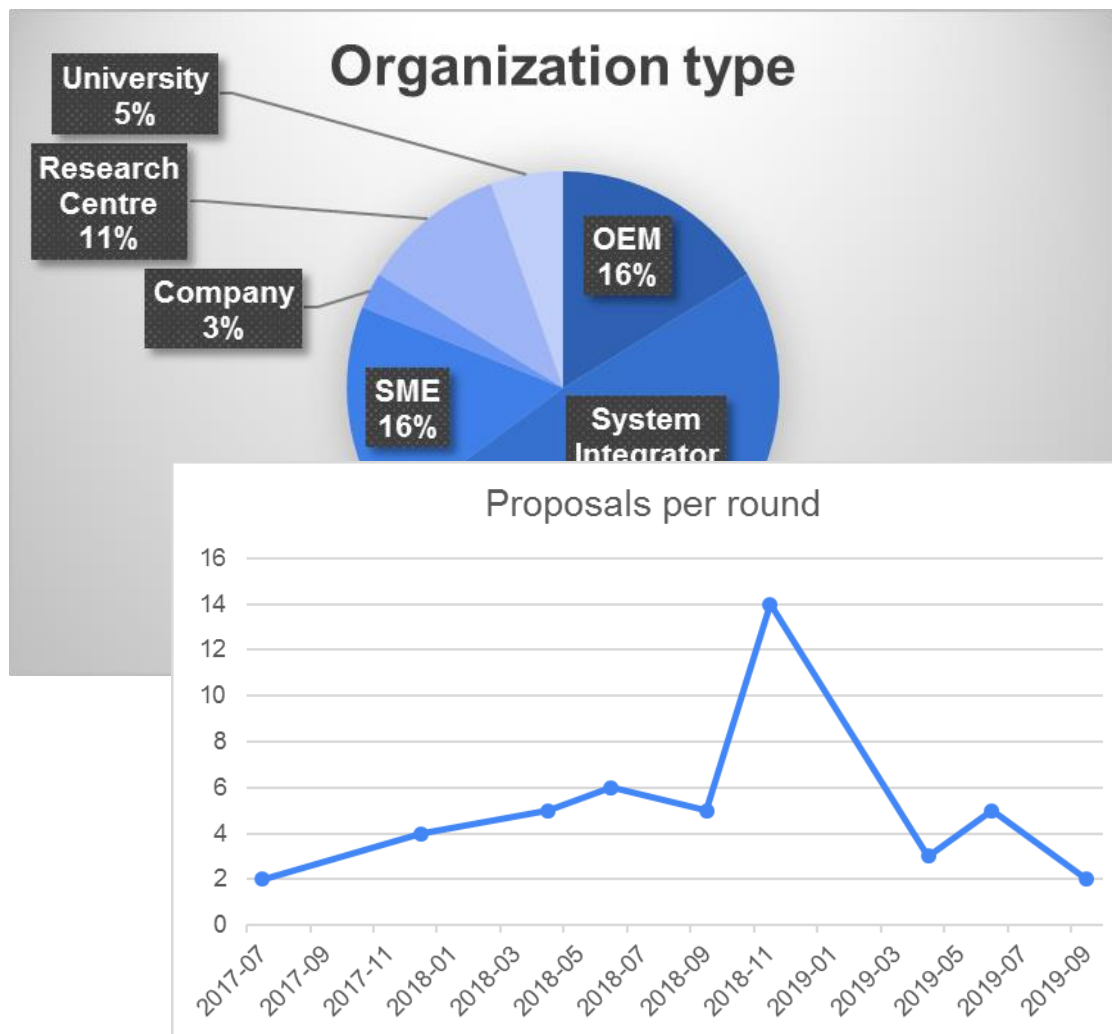
BLACKBOX – ROS based monitoring system

Champion PPM Robotics AS, Norway

FTP statistics



FTP statistics



FTP presentations today

- ROBIN
 - Rafael Arrais (INESC TEC)
- ROS End-Effector
 - Luca Muratore (IIT)
- ROSWELD / Blackbox
 - Trygve Thomessen (PPM Robotics)
- Cross-platform ROS simulation for mobile manipulators
 - Olivier Michel (Cyberbotics)
- Large 3D Inspection / Robust and reliable gps-free localization algorithm for aerial robots applied to industrial applications
 - Paloma Carrasco Fernández (CATEC)