ROS-Industrial quality-assured robot software components

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Lessons learned

• FP7 project Factory-in-a-day
  • Successful tech. transfer model
  • robot software is the challenge
• Amazon Robotics Challenge
  • All performing teams use ROS!
  • Team Delft winner 2016 used ROS-I
ROS-Industrial potential but:

- software quality issues
- not yet widespread outside of service robotics and other niches
- not as familiar to people from other robotics domains
ROS-Industrial potential but:
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Fostering ROS-Industrial:
- software quality assurance
- more relevant commercial cases
- more accessible to people in education AND industry

now EU support through

40+ members

Dec. 12, 2017   ROS-I Conference, Stuttgart

ROSIN - Carlos Hernandez
ROS-Industrial the **EU Digital Industrial Platform for Robotics**

- widely accessible and adopted
- quality software available
- European companies leading ROS-enabled robot capabilities

- **Self-sustaining**

- > 50 *industrial applications* based on ROS-I in continuous use
- **100 members** in the RIC
- **1000 engineers** trained in ROS-Industrial
ROS-in project

Goal:

ROS-Industrial the EU Digital Industrial Platform for Robotics

Help EU companies join ROS-Industrial benefits

Quality Assurance

Working with the community to have better tools:
- continuous integration
- model-in-the loop
- automated test generation
- code scanning

ROSIN FTPs

Open Call for Focused Technical Projects
- new ROS-I software
- open-source
- market pull
- fund 33% project cost

Education

Professionals trained in ROS
- ROS-I Academy trainings
- ROS-I Schools for future professionals
- curriculum
- 3rd party ROS trainings

http://rosin-project.eu
Quality Assurance

How the ROS Community cares for Quality

Yvonne Dittrich, IT University of Copenhagen
ROSIN FTPs

Call for Focused Technical Projects
THE ROSIN OPEN CALL:
3+ MILLION EUR AVAILABLE TO THIRD PARTIES FOR ROS-INDUSTRIAL DEVELOPMENT
What is an FTP?

Improve availability of quality, open source ROS-I software

- target a **concrete business need**, i.e.: software development, definition of technical standards, security and license audits, etc.
- typically **one/two applicants**: a user and a developer
- an expected duration of **12 months**, 3 milestones
- budget of **around € 50K-100K**
- ROSIN funds up to **33%** (milestone 1) max € 100K

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What is an FTP?

- **HW-related components**, e.g. drivers, configuration tools;
- **ROS Enhancement Proposals (REPs)**: REPs are akin to, e.g. IEEE standards with a reference implementation of a working system;
- **algorithms**: e.g., a SLAM algorithm which currently exists only as a MATLAB implementation;
- “application templates” driven by concrete use cases, e.g. a configurable software component for a palletizing work cell;
- **improvement of existing components**, e.g., Rviz, the ROS navigation stack;
- **process-related work**, e.g. code security audits.
- **improvement of documentation**: technical manuals, deployment guides, etc.
- **integration with other software frameworks**
How does it work?
1: FTP Application

**FTP submission**

*Who*
FTP applicants: H2020 eligible robot sw developers and users

*When*
Anytime! we are open to new applications (NO deadline)

*Where*
http://rosin-project.eu/fts

*How*
Simple template (~5 pages)
Focused, well-defined goal
Clear work plan: Milestones
Compromise to fund M2, M3

**Evaluation and selection**

*When*
Every 3 months

*Who*
Experts from ROSIN and ROS-I community

**Contract agreement**

*Who*
ROSIN FTP applicants

*When*
immediately upon selection

*What*
Contract agreement
ROSIN funds 33% (M1)
Applicants fund 67% (M2,3)

ROSIN pays 40% of M1
How does it work?

2. FTP execution

When completion M1
Who FTP developers M1 report
ROSIN experts evaluate
What ROSIN pays M1 60%
Participants pay M2 40%

FTP developers execute
FTP participants pay 60% completed Mil. 40% next Mil.

What
• results open source
• Maintenance and Support
• help disseminate

Who
FTP participants and developers

ROSIN - Dissemination

Dec. 12, 2017 ROS-1 Conference, Stuttgart
ROSIN - Carlos Hernandez
Two FTPs already in execution

**Ensenso-ROSIf**

Interface ROS node for Ensenso stereo cameras.

- Ensenso GmbH
- € 15K
- Germany
- 46 person day

**Robotics Language**

Modular and user-extendable domain-specific robotics language for ROS.

- Robot Care Systems
- € 52K
- The Netherlands
- 12 PM
First results

Ensenso-ROSIf

- ensenso_driver beta release

http://wiki.ros.org/ensenso_driver
https://github.com/ensenso/ros_driver
ROSIN Education

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ROSIN Education Program

- **ROS-I Academy**: equip professionals with the knowledge, skills, and competences to configure and use ROS-based software solutions for industry applications.

- Ignite at **3rd party sites**, allowing ROSIN education activities to better reach local audiences of its core target: **SMEs**.

**Education**

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- curriculum
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Teaching activities in 2017

2017: 100 attendees educated

• **ROS-I Academy 1**: Pilot, Delft, June
  10 Participants

• **ROS-I Academy 2**: Company training, Aachen, July
  5 participants

• **ROS-I Academy 3**: Venice, October
  12 participants

• **ROS-I Trainer Teaching 1**: Stuttgart, September
  3 trainers

• **ROS-I School 1**: Aachen (ROS Summer School), August
  50 participants

• **ROS-I School 2**: Tartu, Estonia, August
  20 participants
Upcoming activities

• ERF 2018 Workshop, “Robot Teaching with ROS”
• ROS-I Academy training Fraunhofer IPA January
• ROS-I Academy and Schools in future Aachen Smart Factory
• ROS-I Academy in future Delft RoboHouse
• Training at 3rd party sites to ignite ROS-I activities
Summary

ROSIN offers support for ROS-Industrial

• Quality assurance
  stay tuned (tomorrow!)

• Education and trainings
  contact

• ROS-Industrial development
  Apply
  \[\text{http://rosin-project.eu/ftps}\]

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Questions?

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More information: http://rosin-project.eu/
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