What does industry need today?
The challenge

Financial
• Robots are not profitable for small assembly lots or changing products

Expertise
• Line workers normally don’t have programming knowledge
• Difficulty to find robot experts in small factories

Flexibility
• Adaptation to variable environments and resources availability is a handicap nowadays
What is drag&bot?
What is drag&bot?

A software solution for easy programming of robot applications

- Hardware-independent
  - Robots
  - Sensors
  - Actuators
  - Effortless integration of new HW

- Runtime environment: sequence controller orchestrates robots by triggering services in middleware like Move, Close, Take Image, …
  - GUI server

- Graphical user interface allows fast and intuitive program definition
- HTML allows use of many different devices (tablet, PC, smartphone)
What is drag&bot?
How far we are?
How far we are?

**Automatica 2016** – First presentation at the fair

**Motek 2016** – Interactive demo at the fair

Currently running pilot projects with different companies
How do we use ROS?
drag&bot ecosystem

Easy robot programming solution

Runtime environment

Module interface

KUKA robots
Universal robots
Denso robots
Schunk gripper
Vision
pitasc (force control)

Wizard interface

Screw-driving

Vision-based

CAD-based

ROS - Industrial Conference
04.11.2016 Stuttgart, Pablo Quilez

Drag&bot interface

GUI
ROS in the loop

drag&bot runtime environment

eclipse.org/4diac

ROS
Increasing ecosystem of ROS nodes!

- Robot driver
- Software module e.g. TF
- Robot driver
- Pose wizard
- ROS Bridge
- Ethernet
- drag&bot executor

Websocket
Extending drag&bot

+ Programming basic blocks (Skills):
  • Skills are programmed following SCXML Open Source Standard
  • Skills contain Python scripts

+ Wizard Web Tools:
  • Wizards are independent Web Servers providing feedback to d&b
  • Wizards based on RobotWebTools (http://robotwebtools.org/)

+ ROS Nodes providing Services and Actions
  • Drivers, software modules providing some functionality
How do we contribute to ROS?
Contribution to the community

+ **Robot drivers**
  
  - Standard interface to robots able to use controller capacities (e.g. IIWA impedance mode):
    - [https://github.com/ros-industrial/robot_movement_interface](https://github.com/ros-industrial/robot_movement_interface)
    - Kuka Sunrise, UR CB3, Denso (on progress)
    - Same documented interface for every robot (action)
    - No need to modify format to add new robots

+ **Research**
  
  - Semantics integration in ROS for real-time transparent topic/service/action transformation
    - ROS tool currently under development, it will be published here: [https://github.com/ipa320/semantic_translation_tool](https://github.com/ipa320/semantic_translation_tool)
+ **ROS promotion to industry**
  
  • Industry perception and acceptation of ROS is changing very fast

+ **Looking for an increasing collaboration with ROS-I Cons.**
  
  • through pilot projects
  
  • through partnership and software interchange (e.g. semantics, software/hardware interfaces)
  
  • providing our software as programming/running as core (licensing) and allow users to extend it as they require with modules, skills…
Thank you for your attention!

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