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

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PPM Robotics AS
PPM Robotics AS “Cutting edge” industrial robotics using ROS I
APPLICATION:
Multi-pass robot welding for one-of-a-kind production

ROSWELD DEVELOPS:
• Innovative ROS based framework for planning, monitoring and control of multi-pass robot applications
• Intuitive, user-friendly GUI

THE FRAMEWORK IS BUILT UPON:
• Components from the project partners' previous research
• Existing ROS technology
ROSWELD – ROS based framework for planning, monitoring and control of multi-pass robot welding

PROJECT TEAM: three partners from Norway
• PPM Robotics AS – Coordinator, Performer (Champion); High-tech robot system integrator
• Mechatronics Innovation Lab AS; Catapult Centre for industrial robotics in Norway
• Rainpower Norge AS; World wide leader within hydro power turbine design and manufacturing.

DURATION: 12 months, kick-off in June 2018
BUDGET: 304k EUR
ROSIN SUPPORT: 100k EUR
SOFTWARE AT INDUSTRIAL QUALITY LEVEL:
• ROSWELD aims to develop a planning, monitoring and control software suite on industrial quality level, for heavy industrial robot applications
• Components will partly be open-sourced and uploaded to the ROS community to be further applied in R&D and industrial applications
• Documentation and training material will be made available.

INDUSTRIALLY VERIFIED AND DEMONSTRATED:
• Pilot case at Rainpower AS (Oslo, Norway)
• Generic setup at The Mechatronics Innovation Lab (Kristiansand, Norway)

REFERENCE PROJECT FOR ROS-INDUSTRIAL:
• International showcase to demonstrate the power of ROS on a best practice example
• General interface for different vendors: modular, easy to replace hardware components
  – Robot: **NACHI/OTC**, Hyundai, Movelt!
  – Welding Power Sources (WPS): Fronius, **OTC**
  – Arc sensor: Fronius, **OTC**
  – Touch sensor: Fronius, OTC
  – Laser scanner: MEL M2-iLAN
  – Welding camera: BlackMagic Design Intensity Shuttle HDMI/Svideo digitalizer, Cavitar Cavilux, Cognex
  – IP camera: any mjpeeg stream over http capable network camera

• The main concept is welding, but based on the main planning interface and drivers, it can be extended to grinding, polishing, painting, cutting or machining
• Following the ROS System Structure
• Each driver/component is a NODE and offers the same functionality (topics and services) in a driver group (robot, WPS, sensors)
• ROS: general and robust communication layer and standards for the different modules
• Used ROS main components: MoveIt!, Rviz, RobotWebTools ROS3d.js, PCL, pyros, rosbridge
• NACHI MR20 7-axis robot
• OTC DA300P Welding Equipment
• MEL M2-iLAN laser scanner
• Cisco WVC210 IP Camera
• Asus VivoPC VM62 server
• Samsung Galaxy Tab / Windows laptop clients
LAB SETUP
ROSWELD – using robot welding as target demonstration, to create general software framework for high-high tech industrial robot applications

OVERALL OUTCOME

ROSWELD is the basic ROS framework for new, high-tech industrial robot systems for multi-pass processes

ROSWELD – releasing industrial innovation by ROS
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