Expert cooperative robots for highly skilled operations for the factory of the future

X-act news

X-act EU Project Newsletter
Issue 2- February 2014

X-act Smart Dual Arm Robot cells setup in COMAU, LMS, TEKNIKER

a) Automotive industry- Hydraulic pump

Customized grippers, fingers, screw driver and vision systems were already installed in hydraulic pump cell. SafetyEye, depth sensor, MGD are being evaluated in this case.

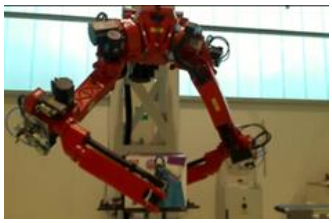
b) Automotive industry- Dashboard pre-assembly

A modular software architecture, integrating Human, Robot, and sensors has been setup. ROS is used as an integration platform. A relational database is used for managing the high amount of data. Grippers manipulating a lengthy and heavy traverse and smaller parts are designed, built and installed.

Microphones, Kinect sensor and MGD are used for interacting with the robot.

c) Rework of electrical appliances Sewing machine disassembly

The Smart dual arm is equipped with vacuum caps &screw driver, able of changing tool through the tool exchange station. Additionally, eye-in-hand camera is used for objects pose recognition.



SafetyEye, laser range-finders and other sensors are being integrated.

In this issue:

X-act Service Oriented Architecture (SOA)

- ✓ *Integration in ROS & ROSJAVA platform.*
- ✓ *Enables both robot programming and execution.*
- ✓ *Utilises Kinect, Manual guidance and Voice based interaction.*
- ✓ *Custom motion planners for dual arm robot motion.*

The Consortium

LMS Project Manager

COMAU ROBOTICS

IK4 TEKNIKER Research Alliance

Fraunhofer

TOFAŞ TÜRK OTOMOBİL FABRİKASI A.Ş.

ALFA hogar

pilz

SIEMENS
(INDUSTRY SOFTWARE LTD) &
(INDUSTRY SOFTWARE SAS)

X-act news

X-act EU Project Newsletter
Issue 2-February 2014

X-act C5G Open controller

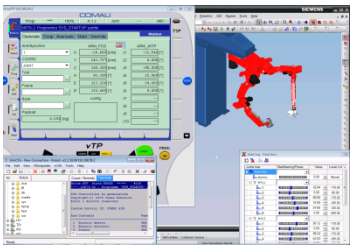
Open concept allows:

a) the development of new innovative motion strategies

b) the integration of external sensors in order to simplify the implementation of complex manufacturing applications

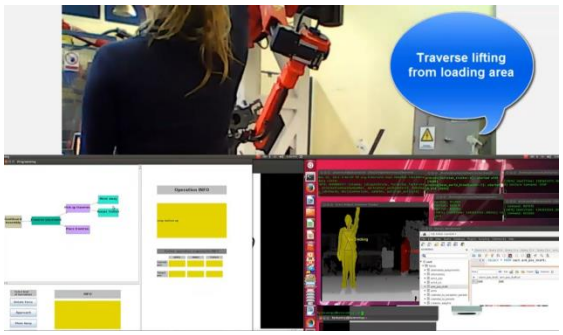
X-act Process simulate integration

- ✓ PSR connected to Comau C5G Virtual Controller
- ✓ Monitor dual arm position
- ✓ Execute programs & Record positions in VRC



X-act Intuitive Interfaces for programming

The integration of sensors (depth sensor, microphone) for HRI is utilizing a ROS based architecture for user friendly robot programming & execution. It allows to program using simple voice commands and gestures.



X-act publications

- ✓ Makris S., Tsarouchi P., Surdilovic D., Krüger J., Intuitive Dual arm robot programming for assembly operations, to appear in CIRP Annals – Manufacturing Technology, Vol. 63, Issue 1, (2014).

X-act news and recent events

- ✓ **18-19 September 2013:** 4th General Assembly meeting-IPK, Berlin, Germany

- ✓ **03-04 December 2013:** 1st Review meeting, Turin, Italy
- ✓ **BIENAL fair,** Bilbao, 2-7 June 2014

X-act upcoming events

- ✓ **March 2014:** Dual arm robots for skilled manufacturing operations-ERF 2014 workshop
- ✓ **Industrial Technologies Conference,** 9-11 April 2014, Athens

Next steps

- ✓ Test beds enhancement & mechatronics installation
- ✓ Safety strategy means implementation
- ✓ HRI strategy implementation

X-act relevant projects

- ✓ AUTORECON, http://www.autorecon.eu/
- ✓ ROBO-PARTNER, http://www.robo-partner.eu/

Contact:

Project Coordinator:

Dr. Sotiris Makris

Laboratory for Manufacturing Systems & Automation (LMS)

Director: Professor George Chryssolouris

Department of Mechanical Engineering & Aeronautics

University of Patras, GREECE

http://www.xact-project.eu/

email: makris@lms.mech.upatras.gr