



X-act



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

X-act EU Project Newsletter
Issue 3- October 2014

X-act news

X-act Smart Dual Arm Robot cells Progress

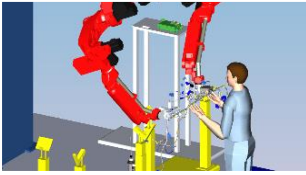
a) Automotive industry- Hydraulic pump

Vision system for hydraulic pump parts identification has been integrated in robot cell. Force sensors have been evaluated also in this case for screwing tasks.



b) Automotive industry- Dashboard pre-assembly

Interaction mechanisms oriented architecture has been completed. This allows close interaction with robot, when safety mechanisms are under installation. Noise cancelling microphones, Kinect, leap motion and MGD are evaluated.



c) Rework of electrical appliances Sewing machine disassembly

Integration of tool changer, vacuum grippers and fixtures have been completed. Safety mechanisms integration and test of UCD methodology has brought the first results.

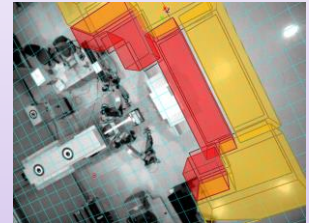


In this issue:

- X-act Smart Dual Arm Robot cells progress
- X-act fenceless supervision system
- X-act offline programming tools
- X-act motion planning tools
- X-act Intuitive Interfaces for programming
- X-act Papers

X-act Fenceless supervision system

- Safety Eye
- Distance and velocity monitoring system
- Signalling mechanisms



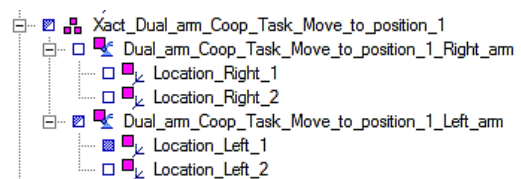
- People detection using Kinect
- Interlock system

The Consortium



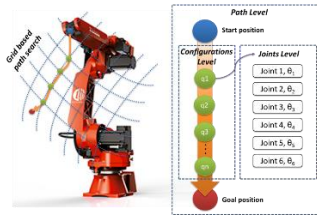
X-act offline programming tools

Process simulate tool for exporting data in X-act Service oriented framework has been developed. Three level tree including in different classification the robot positions.



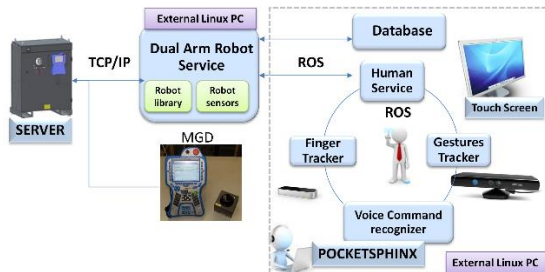
X-act motion planning tools

An intelligent search algorithm is proposed to define the path that leads to the desired position. Multiple criteria are used during alternatives evaluation



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).
- ✓ Panagiota Tsarouchi, Sotiris Makris, George Michalos, Michael Stefos, Konstantinos Fourtakas, Konstantinos Kaltsoukalas, Dimitris Kontrovakis, George Chryssolouris, Robotized assembly process using Dual arm robot, to be presented in 5th CATS 2014 - CIRP Conference on Assembly Systems and Technologies
- ✓ K. Kaltsoukalas, S. Makris, G. Chryssolouris, On generating the motion of industrial robot manipulators, Robotics and Computer-Integrated Manufacturing, Volume 32, April 2015, Pages 65-71, ISSN 0736-5845, <http://dx.doi.org/10.1016/j.rcim.2014.10.002>.
- ✓ Aitor Ibarguren , Inaki Maurtua ,Miguel Angel Perez, Basilio Sierra, Multiple Target Tracking based on Particle Filtering for Safety in Industrial Robotic Cells

X-act news and recent events

- ✓ **13 March 2014:** Dual arm robots for skilled manufacturing operations-ERF 2014 workshop, Rovereto, Italy
- ✓ **05-06 May 2014:** 5th General Assembly meeting-TEKNIKER, Eibar, Spain



- ✓ **BIENAL fair,** Bilbao, 2-7 June 2014
- ✓ **16-17 September 2014:** 6th General Assembly meeting-SIEMENS, Paris

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 finalization and cases quantification
- ✓ Programming tools integration in X-act framework
- ✓ Safety strategy means implementation in dashboard case
- ✓ HRI tools integration and finalize versions

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