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

X-act news

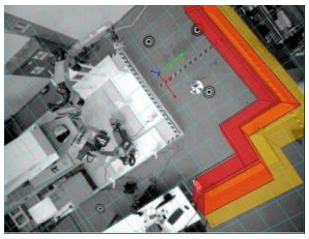
X-act EU Project Newsletter
Issue 5- September 2015

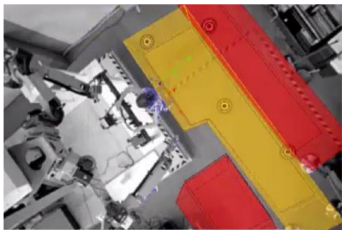
X-act Developments fine tuning & final integration in pilot cases

X-act project finalized the developments for Offline and Online Robot programming and motion planning focused on Dual arm robots, Intuitive interfaces for Interaction and Cooperation and Fenceless supervision system. The three demonstrators are fully integrated and running. Validation approach and LCC analysis were performed for the three different scenarios and data are available in the public deliverable of the Final Demonstrators. The consortium identified and summarized among others in the document the advantages of Dual Arm robot in combination with collaboration/ coexistence with Humans.

X-act Risk Assessment-Dashboard pre-assembly case

The SafetyEYE camera was integrated in the Dashboard pre-assembly case and the relevant Risk analysis were performed by the safety experts (PILZ).





Risks were identified and recorded, when safety measures were applied.

The Consortium

LMS Project Manager, IK4 TEKNIKER, Fraunhofer, TOFAŞ TÜRK OTOMOBİL FABRİKASI A.Ş., ALFA hogar, pilz, SIEMENS (INDUSTRY SOFTWARE LTD) & (INDUSTRY SOFTWARE SAS)

In this issue:

Message from Coordinator

Dear Reader,

The X-act Project has ended this month. I would like to thank the consortium for their excellent work and collaboration in this project, but also for great opportunity in this scientific experience. Additionally, I would like to thank the Research community that helped with their interest, questions in presentations and workshops to improve the X-act project developments and offer helpful solutions for Dual Arm Robot and Human Robot Collaboration in Industrial environments.

I will call you to enjoy our last newsletter and the dissemination staff that will be available in the public the next months.

Best Regards,

Sotiris Makris

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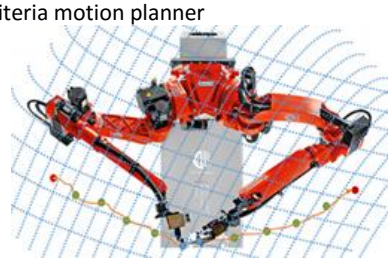
X-act Participation in ERF & IROS 2015

X-act EFFRA portal

X-act Exploitable results

Exploitation package 1: Enhanced Process Simulate:

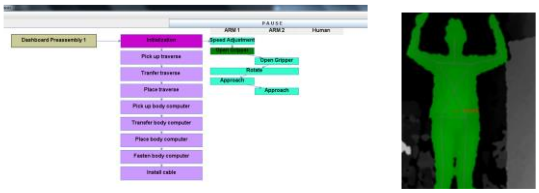
1. Simulation of Dual arm robots
2. OLP-Simulation
3. Process Simulate- COMAU VRC coupling
4. OLP-XML exporter
5. Multi-criteria motion planner



Motion planner

Exploitation package 2: Enhanced Dual Arm Robot Platform:

6. On site motion planner
7. Dual arm robot platform & mechatronics
8. Fenceless supervision system
9. H-R station controller
10. Intuitive HMI
11. CURL ++



H-R station controller & intuitive HMI

X-act publications

- Papacharalampopoulos, S. Makris, A. Bitzios, and G. Chryssolouris, "Prediction of cabling shape during robotic manipulation," *Int. J. Adv. Manuf. Technol.*, vol. 32, pp. 1–8, Jun. 2015.
- Ibarguren, I. Maurtua, M. A. Pérez, and B. Sierra, "Multiple target tracking based on particle filtering for safety in industrial robotic cells," *Rob. Auton. Syst.*, vol. 72, pp. 105–113, Oct. 2015.
- P.Tsarouchi, S.Makris and G.Chryssolouris, "Human-Robot Interaction-Review and challenges on Task planning and Programming", International Journal of Computer Integrated Manufacturing, 2016.
- Panagiota Tsarouchi, et al., ROS based coordination of human robot cooperative assembly tasks-an industrial case study, Cirp-e 2015 (available presentation on https://vimeo.com/141575008), October 2015 (Published).
- G. Michalos, S. Makris, P. Tsarouchi, Toni Guasch, D. Kontovrakis, G. Chryssolouris, Design considerations for safe human robot collaborative workplaces, Cirp-e 2015 (available presentation on https://vimeo.com/141575393), October 2015 (Published).

X-act upcoming events

✓ **Final review meeting- November 2015**
✓ **Participation of FOF workshop, presentation as success story**

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