Workshop Description	
Session Title:	Dual-arm robots for skilled manufacturing operations
Time of workshop:	2014-03-13, 08:30-10:30, CET
Organiser(s):	• Sotiris Makris (LMS-University of Patras) makris@lms.mech.upatras.gr • Gian Paolo Gerio (COMAU Robotics) gianpaolo.gerio@comau.com
Content:	The workshop aims to discuss on the application of cooperative robotic systems in "robot resistant" areas. The workshop will discuss on: • Dual arm robots enabling dexterous operations • Dual arm robots programming and control methods • Interfaces for human-robot cooperation • Safety aspects in industrial dual arm robots The workshop consists of a series of presentations of approximately 15 minutes each, on different aspects of dual arm robots and their applications. This will be followed by discussion with the audience.
Agenda of the workshop:	08:30 – 08:45 Sotiris Makris (LMS-University of Patras) Introduction, X-act project overview 08:45 – 09:00 Gian Paolo Gerio (COMAU Robotics) Dual arm robots - open control 09:00 – 09:15 Dragoljub Surdilovic (Fraunhofer IPK) Dual arm robots programming 09:15 – 09:30 Panagiota Tsarouchi (LMS-University of Patras) Dual arm robot for assembly tasks 09:30 – 09:45 Iñaki Maurtua (TEKNIKER) Dual arm robots for disassembly 09:45 – 10:00 Damien Salle (TECNALIA) Mobile dual arm application in aerospace 10:00 – 10:15 Klas Nilsson (LTH - Lund University) Skilled dual arm robot tasks 10:15 – 10:30 Discussion
Speaker(s):	• Dr. Sotiris Makris, LMS-UniPatras, Robots, Automation and Virtual Reality in Manufacturing • Mr. Gian Paolo Gerio, COMAU, Performance Engineering • Dr. Dragoljub Surdilovic, Fraunhofer IPK, Control systems engineering • Mr. Iñaki Maurtua, TEKNIKER, Robotics Division • Dr. Klas Nilsson, Lund University - LTH • Dr. Damien Salle, TECNALIA, Robotics area director • Ms. Panagiota Tsarouchi, LMS-UniPatras, Robots, Automation and Virtual Reality in Manufacturing
Further	X-act project site: http://www.xact-project.eu

information:	Publications- Further material: • Makris S., Tsarouchi P., Surdilovic D., Krüger J., 2014, Intuitive Dual arm robot programming for assembly operations, to appear in CIRP Annals – Manufacturing Technology. • Krüger J., Schreck G., Surdilovic D., 2011, Dual robot for flexible and cooperative assembly, CIRP Annals - Manufacturing Technology 60/1 5- 8. • Makris S., Michalos G., Eytan A., Chryssolouris G., 2012, Cooperating robots for reconfigurable assembly operations: Review and challenges, CIRP-CMS2012 45th CIRP Conference on Manufacturing Systems, Athens, Greece, Procedia CIRP , 3:.346-351. • Stenmark M., Malec J,, Nilsson K., Robertsson A., 2013 On Distributed Knowledge Bases for Small-Batch Assembly, Cloud Robotics Workshop at IROS 2013, Tokyo, Japan http://www.roboearth.org/wp-content/uploads/2013/03/final-13.pdf • Nilsson E., Topp A., Malec J., 2013, Enabling Reuse of Robot Tasks and Capabilities by Business-related Skills Grounded in Natural Language (Ideas Paper), ICAS2013, Lisbon, Portugal http://www.iaria.org/conferences2013/filesICAS13/skills_idea_icas2013.pdf • Björkelund A., Malec J., Nilsson K., Nugues P., Bruyninckx H., 2012, Knowledge for Intelligent Industrial Robots, Proc. AAAI 2012 Spring Symp. On Designing Intelligent Robots, Stanford Univ., USA • Björkelund A., Malec J., Nilsson K., Nugues P., 2011, Knowledge and Skill Representations for Robotized Production, 18th IFAC World Congress, Milan, Italy • Björkelund A. Edström L., Haage M., Malec J., Nilsson K., Nugues P., Gestegård Robertz S., Störkle D., Blomdell A., Johansson R., Linderoth M., Nilsson A., Robertsson A., Stolt A., Bruyninckx H., 2011, “On the integration of skilled robot motions for productivity in manufacturing”, The IEEE International Symposium on Assembly and Manufacturing (ISAM-2011), Tampere, Finland