

ROBO-PARTNER Project Newsletter

July, 2014

MOTIVATION

Human skills are the main driver that enables producing high added value products in Europe. Thus the manufacturing processes are based on utilizing these skills. ROBO-PARTNER aspires the integration of the latest

industrial automation systems for assembly operations in combination with human capabilities, combining robot strength, velocity, predictability, repeatability and precision with human intelligence and skills.

Message from the Coordinator

Dear Readers,

It is our pleasure to welcome you and introduce you to our first Newsletter of ROBO-PARTNER project. This newsletter aims to continuously update the overview of the project activities and establish a link between the consortium and the project audience at the European Level.

The project has started on 1st November 2013 and it will last 42 months. Fourteen partners from 7 different EU countries and Turkey are meeting together under the coordination of TOFAS and LMS – University of Patras (project manager) towards materializing the project vision of

"Introducing hybrid production solutions involving the safe cooperation of operators with autonomous and adaptable robotic systems through a user-friendly interaction."

The research activities of ROBO-PARTNER are strongly driven and are related to the requirements of the European Industry. The project is currently running through its first phase of activities which is dedicated to the "Generalized end user requirements". The detailed definition of pilot cases as well as the establishment of the validation metrics for each pilot case, are the main activities that the consortium has focused so far. The project pilot cases involve:

1. Rear suspension assembly – Automotive industry (TOFAS),

2. Refrigerators assembly - White goods industry (ELECTROLUX)
3. Large part handling for inspection measuring (TRIMEK)

Phase 1 is completed and in the following months the consortium will be moving to the next which involve:

- Phase 2: Design, implementation and integration
- Phase 3: ROBO-PARTNER pilot cases execution and assessment

We welcome all readers and interested parties to follow our activities through the following issues of this newsletter as well as through the project portal and our social media channels.

Best Regards,

ROBO-PARTNER coordinator

COVER OF ROBO-PARTNER PROJECT FIRST SIX MONTHS



Kickoff Meeting in Turkey

The ROBO-PARTNER Project had its launch on November 19th 2013, when all partners gathered in TOFAŞ, Turkey, to establish the project's ground rules, objectives, and proceedings. The outcome had each partner assigned to different tasks towards the deployment of robotic agents, to assist and collaborate with the human worker, on three separate intra-factory environments.



2nd General Assembly Meeting in Italy

The second ROBO-PARTNER general assembly meeting took place in Susegana, Italy, on February 4th and 5th, 2014. The meeting promoted a visit to Electrolux's facilities, host to one of the project's application scenarios. The meeting also served the purpose of better identifying the needs and issues to each application scenario, as well as to define each element within the software and hardware architecture of all constituting agents.



EU Robotics Forum 2014

The annual euRobotics Forum (<http://www.erf2014.eu/>) took place in Rovereto, Italy between 12 and 14 of March 2014 aiming to explore the interaction of people with robotic technology. ROBO-PARTNER was presented together with the NMP projects LIAA and Factory in a Day in an attempt to inform the community about the research and technical objectives of these projects. George Michalos, PhD, from LMS highlighted the project concept and technological challenges against the key technologies that are promoted by ROBO-PARTNER.



PPP Impact workshop

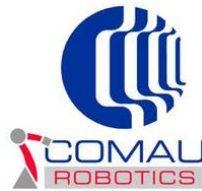
On 24 and 25th of March 2014, the EU Factories of the Future Impact Workshop took place in Brussels, Belgium. The aim of the event was to assess the impact achieved and the potential benefits of clustering of FoF PPP projects. ROBO-PARTNER was presented under the "Humans on the workplace" session of the "Sustainable manufacturing" track. George Michalos, PhD, from LMS presented the technical and non-technical cross cutting issues as well as the synergy activities that the project shares with other 4 projects (LIAA, Robo-Mate, CustomPacker and Factory in a Day)

The Project's Consortium

Project coordinator:



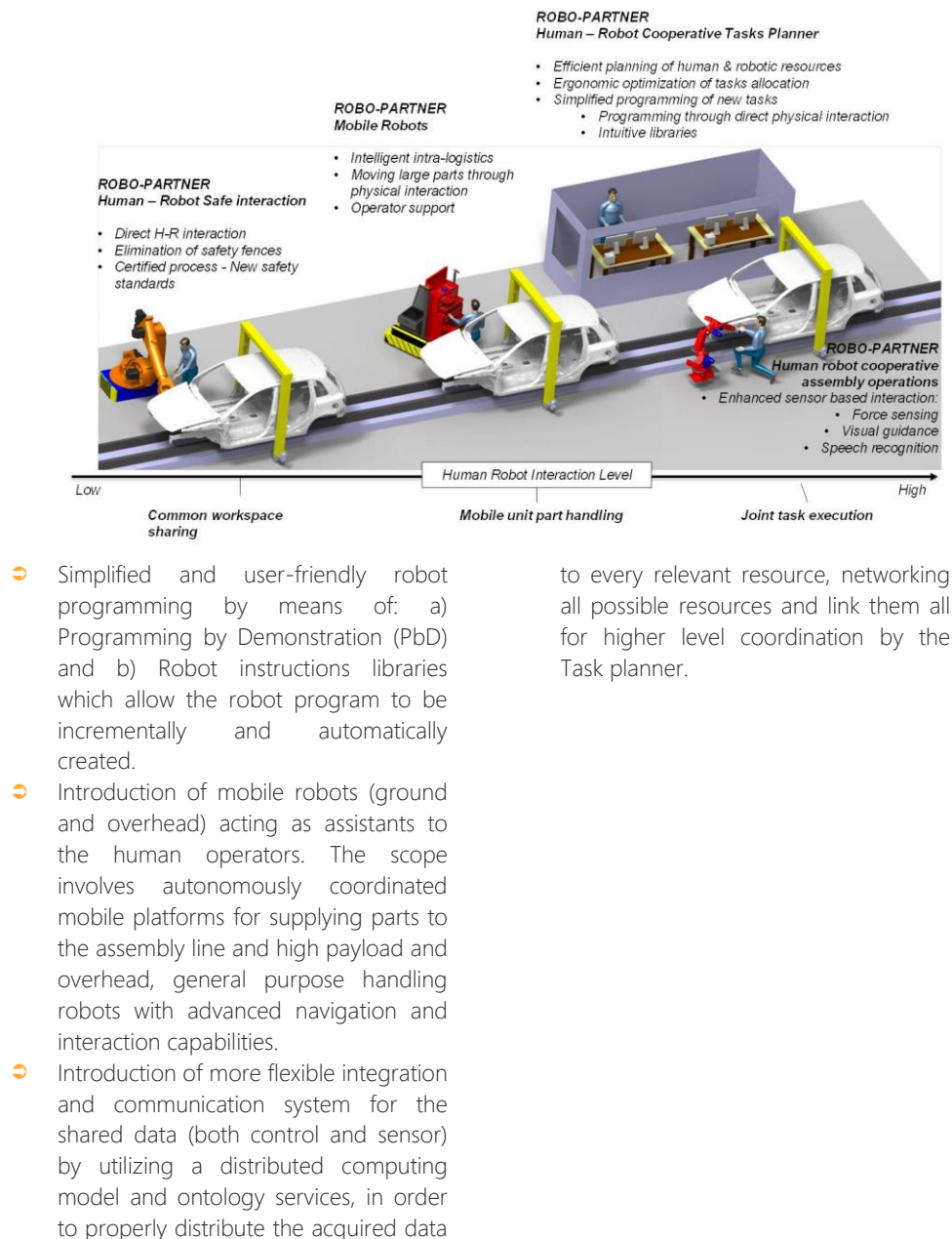
Project Manager:



Objectives

ROBO-PARTNER will work towards achieving the following objectives:

- ⇒ Highly intuitive interfaces for safe human-robot cooperation during assembly and heavy part manipulation by using sensors, visual surveying, speech recognition, advanced control algorithms (such as force/impedance control) to regulate the manipulation of the parts by the robots and close the gap between the human and the robot in the assembly line.
- ⇒ Development and introduction of advanced safety strategies and equipment allowing fenceless human robot assembly cells. Different levels of interaction will be supported: common workspace sharing, small scale cooperation outside the task and joint human robot assembly task execution.
- ⇒ Robust methods and software tools for determining the optimal planning of assembly/disassembly operations using a multi-criteria, simulation enabled approach.
- ⇒ Ergonomics, resource utilization and safety will be the prevailing criteria for designing the hybrid production process.



- ⇒ Simplified and user-friendly robot programming by means of: a) Programming by Demonstration (PbD) and b) Robot instructions libraries which allow the robot program to be incrementally and automatically created.
- ⇒ Introduction of mobile robots (ground and overhead) acting as assistants to the human operators. The scope involves autonomously coordinated mobile platforms for supplying parts to the assembly line and high payload and overhead, general purpose handling robots with advanced navigation and interaction capabilities.
- ⇒ Introduction of more flexible integration and communication system for the shared data (both control and sensor) by utilizing a distributed computing model and ontology services, in order to properly distribute the acquired data

to every relevant resource, networking all possible resources and link them all for higher level coordination by the Task planner.

Targeted results



- ⇒ Multi-modal interfaces for safe human robot cooperation
- ⇒ Human-centered interfaces for robot programming.
- ⇒ Human robot cooperative task planner.
- ⇒ Mobile robots for intelligent intra-logistics.
- ⇒ Overhead cooperative robot for handling large parts.
- ⇒ Safety systems for physical human robot interaction

Project Realization

- Expected Benefits
- Increased re-configurability by enabling the user-friendly reprogramming
- Reduction of programming efforts
- Increased flexibility by the enablement of robot to robot and human robot cooperation
- Increased reliability availability easy maintainability
- Increased Equipment reutilization
- Higher inventory and line availability
- Increased productivity by reducing the fatigue and strain on operators
- Enhanced product quality.



ROBO-PARTNER in Dubai

The May 12th RTEX 2014 Pre-Launch in Dubai, UAE, served to introduce Robot Technology for the forthcoming exposition, scheduled for September 28th. José Barata, PhD, from UNINOVA, was invited to speak of Industrial Robotics and the Horizon2020 Robotic roadmap. While on the subject, the ROBOT-PARTNER was presented as a *Factories of the Future* pilot project under European Commission's 7th Framework Programme. The project provided a perfect example where Academia meets Companies to tackle real tangible problems in Automation Industry, specifically, through migrating Service Robotics technology to the Intra-Factory scene, towards a close interaction with human workers, relieving them from hazardous and strenuous parts of the job. In sum, all directions are taken under Horizon2020's new strategy for European Robotics R&D&I.



ROBO-PARTNER in INDIN 2014

By July 27th, an IEEE Conference in Porto Alegre, Brazil, will host an Industry Forum where each speaker will present Automation, Smart Grids, Embedded Systems for Oil and Gas, Transportation Technologies, Industrial Information Systems and Security, Industrial Distributed Systems and Designs Methods for Self-adaptive Industrial Systems. José Barata, PhD, will have the opportunity to further disseminate the work under ROBO-PARTNER, as it covers most matter under discussion

ROBO-PARTNER Project Newsletter

Next meeting:

4th General Assembly Meeting :
October 2014 @ Patras, Greece

<http://www.robopartner.eu/>

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Contact us

Project Coordinator

Tokçalar Önder
TOFAŞ TÜRK OTOMOBİL FABRİKASI A.Ş.
Tel: +90-224-261.0350
e-Mail: onder.tokcalar@tofas.com.tr



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Project Manager

Dr. George Michalos
Laboratory for Manufacturing Systems and Automation (LMS)
Tel: +30-2610-997262
Fax: + +30-2610-997744
e-Mail: michalos@lms.mech.upatras.gr



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