

# The European Robot Initiative for Strengthening the Competitiveness of SMEs in Manufacturing (Project SMERobot™)



Conventional automation technologies typically give rise to costly and complex systems designed for capital-intensive high-volume production. The SMERobot project aims to develop a new generation of affordable, versatile and human-friendly robots, which will be suitable for deployment in smaller enterprises handling shorter runs with frequent changeovers.

## Background

Automation can be a key to enhanced competitiveness in all kinds of manufacturing operation. However, around half of today's robotic manufacturing technology is geared to sectors such as the automotive industry, where the continuous output of highly standardised products with infrequent variation is the norm. For the many SMEs forming the mainstay of smaller-scale production in the EU, the standard commercially available systems are often too inflexible, too big or too expensive. They thus face the dilemma of opting for current and often inappropriate automation solutions – or, in order to compete with the low-wage economies, striving to cut the cost of methods involving a higher degree of manual intervention.

## Objectives

The SMERobot-project had three goals:

- The new robot should be able to understand, “intuitive” commands, so that it can be shown what to do.
- It should satisfy all safety requirements, so that it can share a workplace with humans.
- And it should be capable of being quickly integrated into an existing manufacturing environment: simply plug and produce.

## Results

Demonstrations of fully functional prototypes were set up in real small and medium sized (SME) production environments of different manufacturing branches (wood processing, small-batch foundry, forging industry and metal parts fabrication), with support from SME-type end-users and system integrators. Training and education was conducted at all levels, from researcher to possible end-users.



In the short term, it is estimated that especially software-related components will reach marketability. These products out of SMErobot research will be: robot safety controllers, teaching by demonstration and automatic programming, shop-floor-suitable simulation tools, life-cycle costing tools, SMErobot Toolbox (teaching, training), object detection and identification (bin picking).

In the medium term, component-oriented results are aimed to reach market maturity levels such as high-performance drives, force-torque-sensors, parallel-kinematic designs, variable stiffness joints, new grippers, integration of novel interfaces in robot instruction such as voice, scanning, pointing, plug & produce networks and optical sensors for active safety monitoring etc.

Larger systems such as novel kinematic designs for SMEs, variable stiffness robotic arms, SME assistants will reach maturity levels in the long term.

## **Impact**

SMErobot has been a joint European effort by robot automation industries to give new impetus to the introduction of robot technology in small and medium-sized businesses:

An entirely new, modular and interactive generation of robots which, in addition to being quick to install and easy to operate, will also help to make European SMEs more competitive thanks to their cost-effective design. To date robotics technology has been the result of requirements motivated by the automotive industries' productivity and cost needs. The project has motivated the development for automation equipment for non-automotive industries in need of strengthening their competitiveness. SMErobot contributed significantly to the innovation lead of robot automation suppliers. European industrial robotics research has been revived by this project.

**For more information, please visit the website: <http://www.smerobot.org/>**

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#### **Partners:**

Fraunhofer-Gesellschaft zur Förderung der angewandten Forschung e.V., represented by it's Institutes: IPA (as SMErobot Coordinator), ISI, ISIT, ABB Automation Technologies Robotics, COMAU S.p.A., KUKA Roboter GmbH, Reis GmbH & Co. KG Maschinenfabrik, Güdel AG, Castings Technology International LTD by Gurantee, Visual Components Oy, Rinas ApS, Prospektiv Gesellschaft für betriebliche Zukunftsgestaltungen mbH (GfAH), German Aerospace Center (DLR) - Institute of Robotics and Mechatronics, Istituto di Tecnologie Industriali e Automazione (ITIA-CNR), Lund University / Institute of Technology, University of Coimbra / ADDF, GPS Gesellschaft für Produktionssysteme GmbH, Pro Support B.V. (Additionally the SMEEIG EESV, a so-called European Economic Interest Group (EEIG), was founded to facilitate the integration and cooperation of both SME end-user and system integrator groups with the Consortium).