Smart Factories: ICT for agile and environmentally friendly manufacturing
Robots improving the shoe production processes

Footwear production is still mainly handcrafted. Currently, opposite to other manufacturing sectors like automotive, food or metal processing, robots are still uncommon in the footwear industry. The introduction of robotics will contribute to overcome the complexity in the automation of the processes of this industry that accounts for some of the shortest production runs to be found. ROBOFOOT will research and develop: new manipulation strategies and devices for non-rigid parts that allowed grasping, handling and packaging of shoes without damaging them;
sensor based robot programming and controlling tools, in particular visual sensors as the base for visual servoing; re-design of some shoe production processes to allow robot assisted manufacturing and assembly.

Footwear production is still mainly handcrafted. Currently, opposite to other manufacturing sectors like automotive, food or metal processing, robots are still out of Footwear industry: only technical shoe producers have introduced robots to assist in the injection moulding process but there are not other relevant applications in use. The introduction of robotics will contribute to overcome the complexity in the automation of the processes of this industry that accounts for some of the shortest production runs to be found. The main difficulties to achieve this goal are:•The high number of products variants. •Complex manufacturing process. •Complex assembly process. •Extensive labour demand on some processes.

To achieve this objective, a consortium composed by 4 Industrial companies, 4 Research centres and 2 Shoe manufacturers will research and develop:•New manipulation strategies and devices for non-rigid parts that allowed grasping, handling and packaging of shoes without damaging them. •Sensor based robot programming and controlling tools that will exploit the information coming from CAD systems and all sensors available, in particular visual sensors as the base for visual servoing, making possible easy to program and flexible robotic applications. •Re-design of some shoe production processes to allow robot assisted manufacturing and assembly, in particular selective heating, visual inspection and packaging.

The consortium has identified a set of six operations in the shoe manufacturing process as the more suitable for short-medium term robotics introduction. They will be packed into three prototypes that will be scheduled through the 30 months duration of the project in such a way that, from early phases, the Footwear Industry may get aware of the potential applications and benefits of robotics in their sector. This research activity is carried out in the framework of the "Factories of the Future" call promoted by the "Cognitive Systems and Robotics" ICT Challenge.

Field of science

/social sciences/economics and business/economics/production economics
/engineering and technology/electrical engineering, electronic engineering, information engineering/electronic engineering/sensors
/engineering and technology/electrical engineering, electronic engineering, information engineering/electronic engineering/robotics

Programme(s)

Topic(s)
Call for proposal

FP7-2010-NMP-ICT-FoF

Funding Scheme

CP - Collaborative project (generic)

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