

The project has defined a set of scientific and technological objectives in the following areas:

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**Manipulation.** The objective is to develop grasping and handling algorithms and devices able to manipulate shoes of different shapes, sizes, colours and material properties, firmly and reliably but avoiding surface damage. This objective demands high adaptation capabilities, flexibility and re-configurability on the solutions proposed. The project will address the manipulation of shoes with and without last.

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**Sensor based Robot control.** One of the objectives is to identify the pose of the shoe and the best position to grasp and manipulate it, and to support in manufacturing and packaging processes.

Furthermore control methodologies have to be different in order to adapt the robot behaviour to the specific requirements of each phase of the production process; therefore, different planning and control algorithms must be available during task execution.

In order to achieve such behavioural flexibility, learning and adaption mechanisms must be integrated into an open control platform. Hence, an intelligent engine able to select and implement the best control strategy for each different case must be developed and implemented on an open control platform. This functionality is not provided by standard robot controller and a new multi-task control paradigm has to be defined within the framework of this research project.

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**Robot programming.** The aim of this task is the creation of new intuitive and adaptable robot programming and control solutions specifically designed for the footwear production integrating the information from CAD/CAM systems and from on-line sensors.

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**Footwear manufacturing re-engineering.** The integration of robotics in the

manufacturing/packaging process requires a deep revision of the process itself and production resources used. This will be done in a comprehensive way paying particular attention to the redesign of roughing, gluing, last milling, inking, polishing, last removal, inspection, last clamping system and the packaging process.

ROBOFOOT will demonstrate that **robotic solutions** for manual tasks that are considered by the industry as being among the most complex and challenging **are possible with the re-design of manufacturing processes, new robot programming and controlling tools, the development of smart end-effectors and the support of machine vision.**

The consortium believes that more areas of footwear manufacturing, besides these tackled in ROBOFOOT, could be addressed in the future for the benefit of European Footwear industry.