

<p style="text-align: center;"><b>Research program:</b> <b><i>“Application of advanced methods for automation software design”</i></b></p>
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**Annex C**

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**Research project**

The research project aims at developing technologies and solutions to enhance the ability of modern factories to be flexible and efficient, appropriately responding to unpredictable changes in market requests.

Modern industries and factories for the production and packaging of products have reached a high degree of automation. Robotic cells for the support of CNC (Computer Numerical Control) machines work side by side with fast automatic machine in modern manufacturing lines to achieve production quality and speed that is absolutely necessary to play a leading role in the current competitive global market.

However, very often robotic cells and automatic machineries are build having in mind production speed and efficiency, with main constraint the development cost. Mechanical and control software parts are usually developed in monolithic manner for satisfying the target specification of the machine, with very little space for any modification or re-use of the parts and components. Therefore is usually difficult to adapt a robotic cell or an automatic machine in a production line to accommodate production changes request due, for example, the changes in market request. This difficult is mainly due to a lack of methodology and technology that enable the concepts of adaptation and modular development of machines and robotic cells. The project aims to the development of innovative devices and machines for supporting the as autonomous-as-possible reconfiguration and adaptation of machinery and robots, as basis for supporting mass customized and highly personalized products and fast reactions to shifts of market demands.

The main goal is the realization of flexible, modular and adaptive manufacturing systems. This objective aims to the development of next-generation production machines with improved automation for achieving a high flexibility and re-configurability of the whole production line. The target is to achieve an automatic or semi-automatic reconfiguration of the production line to handle changes in product and/or working conditions in order to keep the level of the production quality unchanged.