

PUBLIC SELECTION BASED ON QUALIFICATIONS AND INTERVIEW FOR THE AWARDING OF NO. 1 GRANTS LASTING 12 MONTHS FOR CONDUCTING RESEARCH IN ACCORDANCE WITH ART. 22 OF LAW OF 30.12.2010 NO. 240 AT THE DEPARTMENT OF ENGINEERING AND APPLIED SCIENCES OF THE UNIVERSITY OF BERGAMO (ACADEMIC RECRUITMENT FIELD 09/A2 – APPLIED MECHANICS – ACADEMIC DISCIPLINE ING-IND/13 – APPLIED MECHANICS)

announced with decree of the Rector Rep. no. 664/2016 of 20.12.2016 and posted on the official registry of the University on 20.12.2016

RESEARCH PROJECT

“Control structures for robotic systems”

Project objective

Primary objective of the research project is the definition of control structures for robotic systems both fixed and mobile, used both in the typical industrial field and other fields like automotive or food handling ones.

Research project

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In particular, the fixed robotic systems subject of the work belongs to the parallel or serial kinematics machines category, used for "pick and place" positioning operations where the application of a force in the reached position could be required.

The mobile robotic systems mainly deal with material handling inside production areas; the rationalization of the products movement between the different working stations is essential for the optimization of the whole plant's productivity and for the traceability of the products inside the production flow. The movement of the materials is generally realized by means of mobile units moving along paths laid out inside the production area. Subject of the work is to investigate control strategies that allow to manage the products movement system, both in terms of control of the single mobile device and in terms of management of the interaction between the different devices (traffic management, choice of the optimal path, etc.). Besides the control strategy, also the sensors, the hardware platforms on which to implement the control, and the communication protocol between the mobile devices and the centralized management system are very important

Fixed and mobile robotic systems often interact each other, for example when products unloaded from a production line by means of "pick and place" robotic systems and then carried to other production areas where other operations have to be made. The work deals also this topic, always at the aim to optimize the plant productivity.