

PUBLIC SELECTION BASED ON QUALIFICATIONS AND INTERVIEW FOR THE AWARDING OF NO. 1 GRANT LASTING 12 MONTHS FOR CONDUCTING RESEARCH IN ACCORDANCE WITH ART. 22 OF LAW OF 30.12.2010 NO. 240 AT GITT - CENTRE ON INNOVATION MANAGEMENT AND TECHNOLOGY TRANSFER OF THE UNIVERSITY OF BERGAMO AS PART OF THE PLAN "INPROVES - PRODUCT AND PROCESS INTEGRATION FOR THE REALIZATION OF ELECTRIC MOTORS FOR ROAD VEHICLES" FINANCED BY LOMBARDY REGION IN THE CONTEXT OF THE LINE COVERED FOR RESEARCH AND INNOVATION COFINANCED BY POR FESR 2014-2020 (CUP E36D17000090009) - ACADEMIC RECRUITMENT FIELD 09/A2 – APPLIED MECHANICS - ACADEMIC DISCIPLINE ING-IND/13 – APPLIED MECHANICS

announced with decree of the Rector Rep. no. 732/2017 of 15.12.2017 and posted on the official registry of the University on 15.12.2017

RESEARCH PROJECT

TITLE: "Synthesis, design and development criteria for mechatronic and self-adaptive systems"

The research project deals with the development of mechatronic devices characterized by the capability to interact with both the operator and the working environment, leading to a high degree of self-adaptability with respect to the environment and to the working condition.

The interaction with the working environment and the operator may be achieved by means of different technologies as for example force control systems or vision systems.

The integration of a vision system into mechatronic systems allows, for example, to manage the information coming from the sensors (cameras) for the system's control. So the vision system becomes part of the control systems itself: this is "Vision in The Loop".

By means of this technique, it is possible to control the environment where a mechatronic system works and it allows to get high reliability and efficiency.

The use of force control systems allows to realize an efficient interaction with the working environment too; for example, it allows to carry out desired forces on the environment or to make the operator feel forces coming from the environment itself.

Both these techniques are very good instruments to follow the aim of self-adaptability to the working environment of a mechatronic system.

According to the kind of application, the devices may have different configurations, characterized also by different degrees of freedom; aim of the research project is the evaluation of the best approach to the synthesis and the design of such devices, including the choice of the control system and of the relevant algorithms.

Once focused the specific application, the relevant best configuration to perform the task will be chosen.

The research will be carried on also by means of both numeric simulations/co-simulations