PUBLIC SELECTION BASED ON QUALIFICATIONS AND INTERVIEW FOR THE AWARDING OF NO. 2 EARLY STAGE GRANTS LASTING 18 MONTHS FOR CONDUCTING RESEARCH PURSUANT TO ART. 22 OF LAW NO. 240/2010 AT THE DEPARTMENT OF MANAGEMENT, INFORMATION AND PRODUCTION ENGINEERING (A.R.F. 09/G1 – SYSTEMS AND CONTROL ENGINEERING – A.D. ING-INF/04 – SYSTEMS AND CONTROL ENGINNERING (CUP: CUP: E19I18000000009) TYPE B

announced with decree of the Chancellor Rep. no. 632/2019 of 02.10.2019 and posted on the official registry of the University on 02.10.2019

CODE N. 1

RESEARCH PROJECT
"**Control design using non parametric models for predictive maintenance of prodution plants**"

Research structure: Department of Management, information and production engineering
Duration of the grant: 18 months
Scientific Area: 09 - Industrial and information engineering
Academic recruitment field: 09/G1 – Systems and control engineering
Academic discipline: ING-INF/04 – Systems and control engineering
Scientific Director: Prof. Fabio Previdi

Smart4CPPS is an initiative born within the working group "Smart Manufacturing" of AFIL, and specializes the Cyber-Physical System (CPS) paradigm, carrier of Industry 4.0, on the specificities of the Lombard manufacturing, with its excellence in the production of components and machines. The proposed paradigm consists of Smart-CPS, that is, it requires that ICT technologies are no longer only support for production processes, but are integrated into components, machines, and environments that thus become inter-communicating and intelligent CPS. This requires: (i) innovative modular digital infrastructures, which allow the effective management of industrial data in all phases of its life cycle (Implementation Objective - OR1); (ii) innovative and low-cost smart components (OR2); (iii) smart machines that evolve to always maintain maximum productivity (OR3); (iv) and tools for the smart factory (OR4). The four ORs will be analyzed along six Pilots in which the OR enabling technologies will be validated.

The activities of the present research project will be focused on Pilot 1 and Pilot 4. In particular we want to test the new design techniques of controllers based on non-parametric models in the areas of these Pilots. These models are estimated directly from the data using techniques exported by Machine Learning and based on the use of regularization terms. The idea is that on the basis of these methods controllers can be appropriately designed for the object systems of the Pilot (in particular electromechanical and electropneumatic actuators for Pilot 1).

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announced with decree of the Chancellor Rep. no. 632/2019 of 02.10.2019 and posted on the official registry of the University on 02.10.2019

CODE N. 2

RESEARCH PROJECT
"Modeling and identification of production plant using dynamic networks"

Research structure: Department of Management, information and production engineering
Duration of the grant: 18 months
Scientific Area: 09 - Industrial and information engineering
Academic recruitment field: 09/G1 – Systems and control engineering
Academic discipline: ING-INF/04 – Systems and control enginnering
Scientific Director: Prof. Fabio Previdi

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In particular, we want to test the new techniques for identifying dynamic models in the areas of these Pilots using "dynamic networks". These models are estimated directly from the data using traditional prediction error method in closed loop. The idea behind this project is to be able to identify faults in the systems described by these models