

PUBLIC SELECTION BASED ON QUALIFICATIONS AND INTERVIEW FOR THE AWARDING OF NO. 5 EARLY STAGE GRANTS FOR CONDUCTING RESEARCH PURSUANT TO ART. 22 OF LAW NO. 240/2010 FOR A.D. ING-IND/35 (BUSINESS AND MANAGEMENT ENGINEERING), ING-IND/16 (MANUFACTURING TECHNOLOGY AND SYSTEMS), ING-IND/17 (INDUSTRIAL MECHANICAL SYSTEMS ENGINEERING) AND M-PSI/06 - (WORK AND ORGANIZATIONAL PSYCHOLOGY) AT THE DEPARTMENTS AND CENTERS OF UNIVERSITY OF BERGAMO

PICA CODE: 21AR003

announced with decree of the Chancellor Rep. no. 180/2021 of 02.04.2021 and posted on the official registry of the University on 14.04.2021

RESEARCH PROJECT - CODE N. 1

"Smart mobility solution and passenger preferences"

Research structure: Centro di ricerca di Ateneo ITSM (*lccsai Transport AND Sustainable Mobility center*)

Duration of the grant: 36 months

Scientific Area: 09 - Industrial and information engineering

Academic recruitment field: 09/B3 - Business and management engineering

Academic discipline: ING-IND/35 - Business and management engineering

Scientific Director: Prof. Paolo Malighetti

The research project focus on smart mobility in the post Covid environment. The research activities aim to re-think a better use of spaces and transport infrastructure in order to meet emerging needs, to analyse how information sharing and the technological development fit in new solutions that satisfy both privacy and safety needs. The research aims to analyse structural changes in the lifestyle, particularly in the urban context, that can lead to different mobility trends and affect how to develop flexible and resilient transport solutions. In order to do that the first objective is to study evolution of traveller preferences and what drive passenger mobility choice. The second objective is to develop simulation and optimization model for smart mobility solution. The research activities will be developed according to the progress of the Harvard future of mobility project. The output of the research activity is expected to be presented to national/international conferences and to be published on primary international scientific journal.

RESEARCH PROJECT - CODE N. 2

“Application of measurement and control systems for the optimization of advanced manufacturing processes”

Research structure: Department of Management, information and production engineering

Duration of the grant: 12 months

Scientific Area: 09 - Industrial and information engineering

Academic recruitment field: 09/B1 - Manufacturing technology and systems

Academic discipline: ING-IND/16 - Manufacturing technology and systems

Scientific Director: Prof. Gianluca D’Urso

The research aims to develop methodologies based on machine vision techniques for the control and the optimization of advanced manufacturing processes. Models based on neural networks and recognition algorithms for the correction and reconfiguration of process parameters will be improved. The project implicates the execution of experimental tests during which the most significant process parameters will be acquired. These parameters will be correlated with the process and product performances in order to identify the optimal conditions aimed at improving the quality status of the product itself. The collected data will be used as input in the development of the optimization algorithms.

The project is part of the Industry 4.0 paradigm, with the ambition of promoting the dissemination, within business processes, of IoT and ICT fields.

RESEARCH PROJECT - CODE N. 3

"IoT platform implementation to provide predictive maintenance services"

Research structure: Department of Management, information and production engineering

Duration of the grant: 12 months

Scientific Area: 09 – Industrial and information engineering

Academic recruitment field: 09/B2 – Industrial mechanical systems engineering

Academic discipline: ING-IND/17 – Industrial mechanical systems engineering

Scientific Director: Prof.ssa Fabiana Pirola

The research project consists in the implementation of an IoT platform in machinery industry that allows to collect and visualize KPI related to the machine use at customers site, with the aim of offering new value-added services, including condition-based or predictive maintenance.

The project is part of a collaboration with the company SMI S.p.A. which is implementing an IoT platform. More specifically, the research activities will focus on the analysis of data collected from the machines connected to the platform (operating parameters, alarms, ...) aimed both at validating previously identified KPIs and at defining the conditions that require the provision of preventive or condition-based maintenance, i.e. based on the actual condition of "health" of the machine components (for example, definition of the threshold values of certain parameters indicating the need of a maintenance intervention before the failure of a specific component or functional group).

RESEARCH PROJECT – CODE N. 4

“Optimization of asset lifecycle management activities and implementation of smart metering in the integrated water system”

Research structure: Department of Management, information and production engineering

Duration of the grant: 12 months

Scientific Area: 09 – Industrial and information engineering

Academic recruitment field: 09/B2 – Industrial mechanical systems engineering

Academic discipline: ING-IND/17 – Industrial mechanical systems engineering

Scientific Director: Prof. Sergio Cavalieri

The objective of the research project is to optimize the asset management processes and to develop smart metering methods and systems within the integrated water management system in order to ensure the highest level of service and to guarantee the pre-established quality standards by minimizing management costs and unplanned plant stops.

In the light of the positive results obtained within the previous project collaborations with the company Uniacque S.p.A., the research activity will be focused on the optimization of the management of maintenance processes, mainly covering the following topics: reliability analysis of the managed plants, optimization of the management of the workforce dedicated to the activities, study and implementation of smart metering logics and systems.

This activity aims at improving the management of the activities and increasing the operational availability of the plants under analysis.

The activities envisaged by the research program are summarized below:

1. Functional decomposition, failure analysis, and reliability analysis of installed equipment.
2. Implementation of Condition Based Maintenance (CBM) on components identified as critical following a structured criticality analysis.
3. Analysis of the workforce dedicated to plant management and consequent optimization (process and economic) in the planning of maintenance interventions.
4. Identification and application of smart metering technologies dedicated to the management of water management plants.
5. Development of algorithms for prevention and prediction of fault conditions starting from data coming from installed sensors.

RESEARCH PROJECT - CODE N. 5

"Social Innovation Accademy"

Research structure: Department of Human and social sciences

Duration of the grant: 12 months

Scientific Area: 11 - History, philosophy, pedagogy and psychology

Academic recruitment field: 11/E3 - Social psychology and work and organizational psychology

Academic discipline: M-PSI/06 - Work and organizational psychology

Scientific Director: Prof. Giuseppe Scaratti

The project is part of the SCC Innovation Hub & Living lab Network, funded by the Lombardy region. Specifically, the objectives of the Social Innovation academy concern the development and transmission of emerging knowledge from the social sector, with particular reference to the challenges and requests stemming from it.

The intent is to explore significant experiences in the field of food education and widespread walkability, corporate and social welfare (work-family life balance, e-HRM, socio-health realities, voluntary associations, social enterprises, social housing) seeking to produce repertoires and knowledge that can be transferred both to the project partners and to a wider audience, via events of communication (workshop, webinar,...) and civic sensibilization.