

Industrial PhD in Technologies for Resilient Living Environments
Projects for positions Financed/Co-financed by companies and PhD positions Executive XXXVIII
Ciclo¹

Enterprise	BOVIAR Srl (https://www.boviar.com/it/)
Type of location	Ordinary Position 100% financed by the company
Project title	Defectology of existing bridges and definition of integrated structural degradation monitoring systems
Project summary	<p>The research is aimed at determining a setup for monitoring structural degradation in bridge structures that is integrated in the structure itself as put in place during the construction of the structure and that allows you to follow the aging states of the element over time. The activities can be carried out on different lines of research, partly consequential and partly to be developed in parallel, including:</p> <ul style="list-style-type: none"> • Definition and cataloguing of the defectology of existing bridges. • Numerical modeling of defectology. • Definition of measurement setups integrated in the work and data post-processing system and continuous updating. • Definition of possible prototypes for possible future experimental validations.

Enterprise	BOVIAR Srl (https://www.boviar.com/it/)
Type of location	PhD Executive position
Project title	Innovative and sustainable methodologies for structural diagnostics of existing infrastructure
Project summary	<p>The activities to be developed under this research project may include the cataloguing of the existing survey methodologies to identify, at the current state of the art, the most common structural diagnostics for existing infrastructure. the activity will preview moreover the development of innovative techniques and sustainable structural diagnostics with the proposal of innovative and sustainable methodologies of structural diagnostics to make significant progress with the state of the art; specific protocols for investigation.</p>

¹ The activities may also be carried out at locations indicated by the Companies

Enterprise	ASSING SpA (https://www.assing.it/)
Type of location	PhD Executive position
Project title	Study of fuel cell test devices for automotive and/or energy production
Project summary	The aim of the research is to improve the performance of hydrogen fuel cells by environmental parameters of operation; for this purpose a test protocol will be developed that provides for the variation of some quantities, also monitored, and of the operating parameters of the fuel cells evaluate any improvements. The Fuel Cell will be characterized in test during its operation under conditions standard and, subsequently, the test protocol initially established will be applied.

Enterprise	CMD Costruzioni Motori Diesel SpA (https://www.cmdengine.com/)
Type of location	Ordinary Position 100% financed by the company
Project title	Development of innovative catalysts for the Water Gas Shift reaction and alternative methods for the production of methane a from gasification of residual biomass
Project summary	The research is aimed at the analysis, experimentation and development of methods, techniques and components production of hydrogen and biomethane from gasification with possible research fields attributable to: <ul style="list-style-type: none"> • implementation of innovative catalysts active towards the Water Gas Shift reaction with the aim of producing a flow of high pressure hydrogen from the synthesis gas. • development of innovative configurations of catalytic metanation reactors (fixed bed and fluid bed) capable of increase the calorific value of syngas starting from contaminated plant biomass/biomass/residual materials also from the agri-food industry and the like, also different from virgin wood. • optimization of the gasification process by integration with the metanation reactor.

Enterprise	CMD Costruzioni Motori Diesel SpA (https://www.cmdengine.com/)
Type of location	Position co-financed at 50% by the company
Project title	Diagnosis and prognosis of internal combustion gasoline and diesel engines for aeronautical use.
Project summary	The aim of the research will be to identify the most appropriate diagnostic algorithms mainly the attention to the engine components most subject to failure through careful and in-depth bibliographical analysis, followed by an assessment of which failures have the greatest impact on these components with the identification of causes and effects. Goal is to build models that can identify automatically the possible evolution of a malfunction and/or identify states that may evolve towards system malfunction situations, with the prediction of the useful time interval before the occurrence of malfunction.

Enterprise	COSMIND srl (https://www.cosmind.eu/)
Type of location	Position co-financed at 50% by the company
Project title	Design, prototyping and testing of innovative modular systems for sustainable and resilient buildings.
Project summary	<p>The research is aimed at the design, prototyping and testing of innovative modular systems for buildings sustainable and resilient. In particular, the research aims to develop an intervention solution for mutations of the external environment and effective at maintaining the comfort and well-being of the occupants and the context</p> <p>urban, integrating natural elements and eco-friendly materials/techniques. The research also aims to match these systems other technologies still little used, the effects of which have not been investigated (e.g. additive manufacturing), in buildings, but that allow to optimize the design and production phases, integrating innovative and eco-friendly materials capable of increasing the performance characteristics of the modules, and, of consequence of the facade itself.</p>