POLITECNICO DI MILANO

PhD in INGEGNERIA STRUTTURALE, SISMICA, GEOTECNICA / STRUCTURAL SEISMIC AND GEOTECHNICAL ENGINEERING - 39th cycle

THEMATIC Research Field: SIMULATION AND CHARACTERIZATION OF THE MECHANICAL RESPONSE OF COMPOSITE ELEMENTS PRODUCED BY ADDITIVE MANUFACTURING

Monthly net income of PhDscholarship (max 36 months)
€ 1195.5 In case of a change of the welfare rates during the three-year period, the amount could be modified.

Context of the research activity	
Motivation and objectives of the research in this field	HAVING REGARD to the D.D. 104 of 02/02/2022 (call PRIN 2022), within the framework of the National Recovery and Resilience Plan, Mission 4 Education and research – Component 2 From research to business – Investment 1.1, funded by the European Union – NextGenerationEU. Partial financing through project funds PRIN 2022 will take place in the first months of activation of the doctoral scholarship, until the expected PRIN 2022 amount is disbursed. PRIN 2022 Project: Multi-Functional 3D printed Bio-Scaffolds (MULTIFUN3D) Project code: 2022T4LPER - CUP: D53D23004100006. Additive Manufacturing (AM) methods allow obtaining structural components with peculiar mechanical and geometric characteristics for diverse applications on different scales. Today AM can use extruded composite filaments, but reliable procedures for characterizing the material and final products are yet to be defined. The proposed research work aims to develop indirect identification procedures that combine specifically designed experimental tests with the numerical simulation of the investigated systems.

Methods and techniques that will be developed and used to carry out the research	The research activities to be carried out in this context include the selection (and, possibly, development) of suitable models that interpret the mechanical response of extruded composite filaments and lattice structures formed by AM. The parameters entering the models will then be quantified using inverse analysis procedures based on the experimental information made available by the partners of this research project, exploiting full-field measurement techniques.
Educational objectives	Doctoral candidates will be provided with high-level scientific training, fostering and refining research and problem solving abilities by focusing on both theoretical and experimental skills related to the simulation and mechanical characterization of innovative materials and structures.
Job opportunities	The interdisciplinary expertise and complementary competences acquired within the present project can be easily spent in national and international academic and non-academic institutions and organizations, engaged in innovation, research and technical development.
Composition of the research group	0 Full Professors 3 Associated Professors 3 Assistant Professors 2 PhD Students
Name of the research directors	Gabriella Bolzon

Contacts
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Additional support - Financial aid per PhD student per year (gross amount)	
Housing - Foreign Students	--
Housing - Out-of-town residents (more than 80Km out of Milano)	--

Scholarship Increase for a period abroad

Amount monthly	597.75 €
By number of months	6

Additional information: educational activity, teaching assistantship, computer availability, desk availability, any other information

Educational activities (purchase of study books and material, funding for participation to courses, summer schools, workshops and conferences): The Ph.D. course supports the educational activities of its Ph.D. students with an additional funding equal to 10% of the scholarship, starting from the first year.

Teaching assistanship (availability of funding in recognition of support to teaching activities by the PhD student): Ph.D. students are encouraged to apply, upon prior authorization, to the calls to support teaching activities at the undegraduate and Master levels at Politecnico, being paid for that. The teaching assistantship will be limited up to about 80 hours, maximum half of them devoted to teaching and classroom activities and the rest to support classworks and exams.

Computer availability and desk availability: Each Ph.D. student has his/her own computer for individual use. Each Ph.D. student has his/her own desk, cabinet and locker.