



PhD in INGEGNERIA STRUTTURALE, SISMICA, GEOTECNICA / STRUCTURAL SEISMIC AND GEOTECHNICAL ENGINEERING - 40th cycle

PNRR 629 PA Research Field: RISK ASSESSMENT OF FAST LANDSLIDES INDUCED BY SEISMIC ACTIONS

Monthly net income of PhDscholarship (max 36 months)
€ 1400.0
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	<p>The research activity aims at enhancing public safety and public/private companies decision making through landslide risk assessment in Italy, particularly in seismically active regions. The objective is to develop AI-based meta-models that can accurately map inception and propagation hazard of rapid landslides, enabling better-informed decisions for land management and disaster prevention. The open collaboration with the Dipartimento di Protezione Civile within the research plan will contribute to reach one of the PNRR goal by helping in redesigning and simplifying organizational models to be adopted in order to guarantee a greater effectiveness and efficiency of public actions.</p>
Methods and techniques that will be developed and used to carry out the research	<p>The research will employ a combination of advanced physically based constitutive models and numerical methods such as the material point method (MPM) to simulate fast landslide triggered by seismic events, from the inception to the propagation phase. AI meta-models will be trained using data from these simulations to provide a fast and decision-making-oriented tool to predict landslide hazards under different scenario. This approach ensures a robust framework for mapping at the large scale the national territory.</p>
Educational objectives	



	<p>This doctoral program aims at developing candidate skills in soil mechanics, risk assessment and decision making. The challenge of synthesizing information coming from a limited number of physically based numerical models using AI will train the candidate towards future problem solving in engineering applications. The curriculum is designed to enhance the candidate's skills in interdisciplinary collaboration, critical thinking, and individuation of innovative solutions in the field of environmental and civil protection.</p>
Job opportunities	<p>Upon completion of the Ph.D., the candidate will be well-prepared for a career in academic research, governmental or non-governmental organizations focused on environmental management, civil engineering, or disaster risk reduction. The skills acquired will also be highly applicable in sectors like urban planning, public administration, and consultancy company focusing on digital transitions.</p>
Composition of the research group	<p>1 Full Professors 1 Associated Professors 1 Assistant Professors 1 PhD Students</p>
Name of the research directors	<p>Claudio di Prisco</p>

Contacts	
<p>claudio.diprisco@polimi.it</p>	

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	700.0 €
By number of months	6

National Operational Program for Research and Innovation	
Company where the candidate will attend the stage (name and brief description)	Dipartimento di Protezione Civile (https://www.protezionecivile.gov.it/it/)
By number of months at the company	6
Institution or company where the candidate will spend the period abroad	Ecole Centrale de Nantes (https://www.ec-nantes.fr/)



candidate will spend the period abroad (name and brief description)	
By number of months abroad	6

Additional information: educational activity, teaching assistantship, computer availability, desk availability, any other information
<p><u>Educational activities</u> (purchase of study books and material, funding for participation to courses, summer schools, workshops and conferences): financial aid per PhD student per year. 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.</p> <p><u>Teaching assistantship</u>: availability of funding in recognition of support to teaching activities by the PhD student. There are various forms of financial aid for activities of support to the teaching practice. The PhD is encouraged to take part in these activities, within the limits allowed by the regulations.</p> <p><u>Computer availability</u>: each Ph.D. student has his/her own computer for individual use.</p> <p><u>Desk availability</u>: each Ph.D. student has his/her own desk, cabinet and locker.</p>