POLITECNICO DI MILANO

PhD in INGEGNERIA MECCANICA / MECHANICAL ENGINEERING - 38th cycle

Research Area n. 3 - Engineering Design and Manufacturing for the Industry of the Future

THEMATIC Research Field: MACHINE LEARNING AND ARTIFICIAL INTELLIGENCE FOR AUTOMATED 3D MODELING AND RECONSTRUCTION OF REAL OBJECTS

Monthly net income of PhDscholarship (max 36 months)
€ 1325.0
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	Virtual Reality (VR) is a widespread technology that develops interaction between humans and simulated environments for multiple purposes. The need for a real-time response of VR systems imposes strict constraints on the digital content, which is usually manually generated and optimized. A crucial problem arises with VR scenarios made by thousands of instances of a set of more straightforward 3D items, as often happens in VR applications. The manual approach involves significant resources in terms of time, which are even more remarkable if we consider that such 3D models in some applications must be frequently updated.
Methods and techniques that will be developed and used to carry out the research	The research proposal aims at identifying suitable techniques in the field of Machine Learning (ML) and Artificial Intelligence (AI) to automate the 3D modeling and reconstruction processes of objects whose shape can be classified according to predefined geometrical categories.
Educational objectives	• Mastering Machine Learning and Artificial Intelligence techniques for object recognition and reconstruction, and specific knowledge relevant to their own research interests, including theories and methods; • Developing a research methodology that leads to the

	definition of effective application methods; • Demonstrating the ability to make original and significant contributions to the scientific knowledge base in their area of research; • Demonstrating the ability to engage in a productive research career, including publications, grant writing, and conference presentations;
Job opportunities	Our last survey on MeccPhD Doctorates highlighted a 100% employment rate within the first year and a 35% higher salary, compared to Master of Science holders in the field. This PhD scholarship is funded by **invrsion S.R.L** (https://www.invrsion.com/).
Composition of the research group	0 Full Professors 1 Associated Professors 0 Assistant Professors 0 PhD Students
Name of the research directors	Prof. Giandomenico Caruso

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	662.5 €
By number of months	6

Additional information: educational activity, teaching assistantship, computer availability, desk availability, any other information
Financial aid is available for all PhD candidates (purchase of study books and materials, funding for participation in courses, summer schools, workshops and conferences for a total amount of euro 5.401, 42).

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Our candidates are strongly encouraged to spend a research period abroad, joining high-level research groups in the specific PhD research topic, selected in agreement with the Supervisor. An increase in the scholarship will be applied for periods up to 6 months (approx. 662, 50 euro/month - net amount).