POLITECNICO DI MILANO

PhD in INGEGNERIA DELL'INFORMAZIONE / INFORMATION TECHNOLOGY - 39th cycle

Research Area n. 1 - Computer Science and Engineering

PARTENARIATO PNRR Research Field: MULTIPLE VIEW GEOMETRY: THEORY AND PRACTICE

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	Recovering a 3D scene from multiple images and, more generally, studying the geometry of cameras, are fundamental problems in Computer Vision with many practical applications including robotics scenarios. Although significant advancement has been made during the last decades, several open issues still remain, for example, in relation to 3D reconstruction and localization, projective structure from motion, solvability of viewing graphs and synchronization, compatibility of fundamental matrices, autocalibration, conjugate translations, just to name a few. The candidate will develop new algorithms and/or theoretical results for relevant problems in single-view and multiple view geometry.
Methods and techniques that will be developed and used to carry out the research	The candidate will i) survey the literature for single-view and multiple view geometry; ii) identify open problems; iii) explore geometry and optimization tools (e.g., polynomial solvers) to derive new theoretical results and/or practical algorithms for the target problems; iv) investigate the advantages of the found solutions via experiments on real datasets.
Educational objectives	The candidate will develop a strong background in geometry and optimization in Computer Vision. The

	research activity will be both theoretical (mathematical formulation and algorithm design) and practical (experimental evaluation on relevant datasets).
Job opportunities	The PhD candidate will have an excellent qualification to pursue either an academic career (with strong competences both in theory and applications) or being involved in industry-related jobs (where the need for expertise in computer vision is increasing).
Composition of the research group	0 Full Professors 1 Associated Professors 3 Assistant Professors 8 PhD Students
Name of the research directors	Federica Arrigoni

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	700.0 €
By number of months	6

Additional information: educational activity, teaching assistantship, computer availability, desk availability, any other information
Educational activity (purchase of study books and material, including computers, funding for participation in courses, summer schools, workshops and conferences): financial aid per PhD student will be given based on the regulations. Teaching assistantship: There are various forms of financial aid for activities of support to the

teaching practice. The PhD student can take part in these activities, within the limits allowed by the regulations. Computer and desk availability: the student will be allowed to access facilities of the DEIB.

This project research is in the framework

FAIR

PARTENARIATO ESTESO FUTURE ARTIFICIAL INTELLIGENCE RESEARCH -
 D53C22002380006

D.D. 1555 del 11/10/2022

D.D. 341 del 15/03/2022 Avviso pubblico per la presentazione di Proposte di intervento per la creazione di ?Partenariati estesi alle università, ai centri di ricerca, alle aziende per il finanziamento di progetti di ricerca di base? ? nell?ambito del Piano Nazionale di Ripresa e Resilienza, Missione 4 ?Istruzione e ricerca? ? Componente 2 ?Dalla ricerca all?impresa? ? Investimento 1.3, finanziato dall?Unione europea ? NextGenerationEU