



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

Research Area n. 4 - Telecommunications

**PARTENARIATO PNRR Research Field: MULTIMEDIA SIGNAL PROCESSING FOR
INTERACTION IN XR**

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**

This research project is in the framework of
RESTART
PARTENARIATO ESTESO RESEARCH AND
INNOVATION ON FUTURE TELECOMUNICATION
SYSTEMS AND NETWORKS TO MAKE ITALY MORE
SMART
CUP D43C22003080001
Decreto di Concessione D.D. 1549 del 11/10/2022

The interest in Extended Realities (XR) has significantly grown in the past few years. Research often focuses on realism, while engagement and presence tend to depend more on quality of interaction, depending on the target function. Of significant concern is also the face validity of the content, particularly when spaces are shared by multiple actors in social contexts. Multimedia signal processing should therefore be focusing on function-driven effectiveness of interaction and trustworthiness.

**Methods and techniques that will be
developed and used to carry out the
research**

Model-driven as well as data-driven signal processing solutions will be considered and/or developed for various purposes: improving the quality of the interaction experience (mitigation of the impact of latency, improving synchronicity through multimodal rendering, improving immersiveness, and developing deep fake detection



	methods).
Educational objectives	This doctoral program will be aimed at boosting the student's background on various forefronts, including: multimodal signal processing, space-time audio processing, and machine learning applied to audio and video.
Job opportunities	The opportunities afforded by this line of research are many. Former PhD graduates focusing on similar topics have found jobs in social media as well as streaming services, or with companies operating in the area of audience intelligence.
Composition of the research group	2 Full Professors 2 Associated Professors 2 Assistant Professors 12 PhD Students
Name of the research directors	Stefano Tubaro, Augusto Sarti

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
<p>The funding for the scholarship comes from the PE14, RESTART (SPOKE 4 ? PoliTo, FunMedia Project).</p> <p>LIST OF UNIVERSITIES, COMPANIES, AGENCIES AND/OR NATIONAL OR INTERNATIONAL</p>



INSTITUTIONS THAT ARE COOPERATING IN THE RESEARCH: Politecnico di Milano; Politecnico di Torino, Università di Padova, Purdue University, Imperial College

EDUCATIONAL ACTIVITIES (purchase of study books and material, including computers, funding for participation in courses, summer schools, workshops and conferences): financial aid per PhD student
5.707,13 Euro

TEACHING ASSISTANTSHIP: (availability of funding in recognition of supporting teaching activities by the PhD student)

There are various forms of financial aid for activities of support to the teaching practice. The PhD student is encouraged to take part in these activities, within the limits allowed by the regulations.

COMPUTER AVAILABILITY: individual use

DESK AVAILABILITY: individual use

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