POLITECNICO DI MILANO

PhD in BIOINGEGNERIA / BIOENGINEERING - 41st cycle

THEMATIC Research Field: AI-DRIVEN PERSONALIZED HUMAN-MACHINE INTERACTION

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	The main objective of this work is to develop individual monitoring tools and data analytics techniques including but not limited to artificial intelligence (AI) algorithms and mathematical models to characterize and improve human-machine interaction, towards the development of, for example, next-generation personalized robots and hearing assistance devices. The research activity of the PhD will be carried out in the framework of two ongoing projects at CNR-IEIIT and will significantly contribute to the advancements in the field. In particular, the PhD is related to the following projects, relevant to the PhD research theme and highly interconnected: - FIT4MedRob - Progetto MUR PNRR PNC “Fit for Medical Robotics - PNC0000007 - Spoke 3 codice CUP: B53C22006960001). Specifically, the research at CNR-IIEIT includes the development of novel, AI-driven tools and algorithms to enable personalized human-robot interaction for application in social and conversational robots. - “TAILORED-AI, Tailored AI-enabled Listening for Optimized Real-world Experience in Daily life” (GORU-IEIIT, DIT.AD009.181.001), aimed at developing personalized listening interfaces to achieve optimal, customized listening experience and speech recognition performance with limited listening and cognitive effort, thus enabling real-time adaptation of assistive technology

	(e.g., hearing devices, multisensory robot-aided rehabilitation) to the evolving individual needs and contexts in daily life.
Methods and techniques that will be developed and used to carry out the research	The developed techniques will include a combination of machine learning, signal processing, statistical and mathematical modeling, and optimization techniques.
Educational objectives	To train the PhD student in data analytics and modeling techniques including machine learning, statistical and mathematical modeling, and optimization for application in next-generation, AI-driven personalized human-machine interfaces.
Job opportunities	The research will be carried out in the framework of ongoing collaborative research projects at CNR-IEIIT, in collaboration with partners from academia, healthcare organizations, and industry in Italy and abroad, within the abovementioned projects Fit4MedRob and TAILORED-AI as well as within the context of other ongoing research projects and research collaborations in this thematic area. CNR-IEIIT has large opportunities for post-doc positions and interdisciplinary research careers and has strong links with several academic and industrial partners at national and international level.
Composition of the research group	1 Full Professors 3 Associated Professors 4 Assistant Professors 2 PhD Students
Name of the research directors	Alessia Paglialonga

Contacts
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Additional support - Financial aid per PhD student per year (gross amount)	
Housing - Foreign Students	--
Housing - Out-of-town residents	--

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: The student will be encouraged to attend to courses at POLIMI or abroad 2 / 3 in International Schools.

Teaching assistantship: 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 and desk availability: the student will be allowed to access facilities of the DEIB.