

Politecnico di Milano

PhD in Bioengineering

**Research Title: (Advanced Human-Robot Interaction and
Collaboration|
Interazione e collaborazione avanzate uomo-robot)**

Scholarships and Financial support	
Monthly net income of PhD scholarship (max 36 months)	€ 1.250/mensili (In case of a change of the welfare rates during the three-year period, the amount could be slightly modified)
Increase in the scholarship for stays abroad	€ 566,36 per month, for up to 6 months
Number of scholarships	1
Beginning of PhD	May 1 st 2020
Deadline for application	March 10 th 2020
Context of the research activity	
Motivations and objectives of the research in this field	<p>This theme will aim to create advanced human-robot interaction control schemes for productive and ergonomic role-allocation and task coordination in hybrid manufacturing environments.</p> <p>This collaborative control scheme will enable real-time adaptation of collaborative robots to human dynamic factors and intentions. The focus will be on the development of real-time human dynamic models to track dynamic states and human ergonomic factors. Consequently, robot responses will be formed to assist the worker to perform the intended tasks in configurations in which the risks of injuries are minimum. MOCA robot from IIT (mobile collaborative</p>

	<p>robot assistant) will be used in the experiments and the control of mobility and manipulation will be central to the robot control developments.</p> <p>The successful candidates will work on the ERC project Ergo-Lean GA 850932, which aims to improve human ergonomics in highly dynamic human-robot-environment interactions.</p>
Methods and techniques that will be developed and used to carry out the research	<p>Research activities foresees extensive in lab experimentation at the Human Robot Interfaces and Physical Interaction (HRI² – hri.iit.it) of the Istituto Italiano di Tecnologia, Genova</p>
Educational objectives	<ul style="list-style-type: none"> - To learn scientific research methods in bioengineering, robotics and artificial intelligence - To learn team working - To improve scientific dissemination skills
Job opportunities	<ul style="list-style-type: none"> - Robotic and automation companies - Agile manufacturing industry - Universities and research centres
Composition of the research group	<ul style="list-style-type: none"> - POLIMI: 1 Full Professor, 2 Associated Professors, 2 Assistant Professors www.nearlab.polimi.it - HRI² Laboratory: https://hri.iit.it/
Names of the research directors	<p><i>Arash Ajoudani (IIT)</i> <i>Elena de Momi (POLIMI)</i></p>
Contacts	<p>arash.ajoudani@iit.it elena.demomi@polimi.it</p>
Additional support	
<p><u>Housing:</u> financial aid per PhD student per year (gross amount)</p>	<p><u>Foreign students* inserire solo se rilevante</u> 1st year:euros per student 2nd year..... euros per student 3rd year:euros per student</p> <p>(max number of financial aids available....., given in order of merit)</p> <p><u>Out-of-town residents (more than 80 Km out of Milano)</u> 1st year: ...euros per student 2nd year: ...euros per student 3rd year: ... euros per student</p> <p>(max number of financial aids available....., given in order of merit)</p>
Additional information: educational activity, teaching assistantship, computer availability, desk availability, any other informations	
<p>IIT will provide a desk, a personal laptop and if necessary a desktop PC to the candidate during the whole PhD period</p>	