



PhD in INGEGNERIA GESTIONALE / MANAGEMENT ENGINEERING - 39th cycle

**PNRR 118 INTERDISC Research Field: HUMANIZING MED TECH INNOVATION. THE RISE
OF THE HUMAN MED TECH PARADIGM**

Monthly net income of PhDscholarship (max 36 months)
€ 1450.0
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	<p>Interdisciplinary PhD Grant The PhD research will be carried out in collaboration with research groups of the PhD programme in "BIOENGINEERING". See https://www.dottorato.polimi.it/?id=422&L=1 for further information.</p> <p>MedTech innovation (which combines digital and biomedical) is undermining the traditional paradigms of development and adoption of innovation in healthcare. Innovations enabled by artificial intelligence (AI), are a key pillar of the PNRR and in particular Mission 1 linked to digitalization and innovation. Yet AI, extended reality, robotics, etc. require a careful understanding of the new interactions that citizens/patients and health professionals (doctors, nurses, technicians) will have with them, as well as the social, ethical, and legal implications of these innovations. This understanding is combined with the pressing need of European policymakers to transition towards a new model of technological development in healthcare that does not neglect the "human" perspective, according to a paradigm of "Human Med Tech Innovation". The motivation is to accelerate the spread of medical technologies that are inclusive, sustainable and attentive to individual and social well-being, which generate added value for the patient and society. This concept is also linked to the European Commission's effort to promote a "humanized" vision of I5.0</p>



	<p>technologies, pushing researchers and professionals to study innovative solutions centred on the person.</p> <p>The present multidisciplinary doctoral research aims at contributing to the health and well-being of the population (SDG3) through the evolution of the current model of development of biomedical and digital innovation through the inclusion of the "human" perspective in all its phases (or TRL): concept, prototyping, validation with clinical trials, market access and adoption by citizens/patients and health professionals (doctors, nurses, technicians).</p> <p>The research falls within the "HumanTech - Humans and Technology" project. The HumanTech project has been selected and funded by the Ministry of University and Research (MUR) for the period 2023-2027 within "Dipartimenti di Eccellenza" (Law 232/2016), the ministerial initiative aimed at rewarding the departments that stand out for the quality of their research and at financing specific development projects.</p>
<p>Methods and techniques that will be developed and used to carry out the research</p>	<p>The proposed research would investigate biomedical and digital innovation throughout its entire life cycle, divided into four main phases according to the TRL (Technology Readiness Level): basic research (TRL1-2), translational research (TRL 3-5), clinical validation (TRL 6-7), go-to-market (TRL 8-9).</p> <p>The engineering skills and methods provided by the PhD in Biomedical Engineering would be complemented synergistically by those provided by the PhD in Management Engineering, thus offering the candidate the interdisciplinary skills necessary to understand the limitations of current mono-disciplinary research and propose innovative and integrated research questions and study designs. For example, the integration of engineering variables in rational models of technology adoption in healthcare (e.g. TAM, TPB, UTAUT models, etc.) would allow an important advance compared to current knowledge.</p> <p>In addition, the candidate will be able to generate new evidence by integrating quantitative and qualitative research, combining experimental laboratory data and simulation models with focus groups, interviews and surveys.</p>



<p>Educational objectives</p>	<p>Beyond developing a distinctive understanding of the MedTech and Healthcare industry, and the challenge of humanizing MedTech innovations, the PhD Student will learn how to design a sound research project, and how to develop a new theory and validate it through a robust research design. Moreover, the PhD Student will learn how to interact with the scientific community (i.e., conferences and papers) and with leading companies and Institutions.</p>
<p>Job opportunities</p>	<p>Once defended his/her PhD dissertation, the selected Student will have the opportunity to explore - together with the research group and his/her supervisors - different job opportunities.</p> <p>First, he/she might remain in academia with a Post-Doc position within the research group or in another Business School.</p> <p>Second, he/she might apply for a senior position outside academia in (i) enterprises operating in either the MedTech and Health Care industry or others, (ii) consultancy firms that are specialized in the topics addressed within the doctoral research, (iii) national/international Institutions (e.g., ISS; EMA, WHO etc.) operating in the MedTech and Health Care ecosystem, or (iv) any other organization interested to the distinctive competences and network of contacts developed during the doctoral research.</p> <p>Third, he/she might explore an entrepreneurial career by exploiting the results achieved during the doctoral studies by funding a start-up.</p>
<p>Composition of the research group</p>	<p>4 Full Professors 2 Associated Professors 2 Assistant Professors 3 PhD Students</p>
<p>Name of the research directors</p>	<p>Emanuele Lettieri and Alberto Redaelli</p>

Contacts	
<p>emanuele.lettieri@polimi.it (DIG), alberto.redaelli@polimi.it (DEIB)</p>	



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	725.0 €
By number of months	6

National Operational Program for Research and Innovation	
Company where the candidate will attend the stage (name and brief description)	
By number of months at the company	0
Institution or company where the candidate will spend the period abroad (name and brief description)	To be defined
By number of months abroad	6

Additional information: educational activity, teaching assistantship, computer availability, desk availability, any other information
<p>The selected PhD Student will be offered the opportunity to develop teaching capabilities through involvement as a teaching assistant in one/two of the courses chaired by the Professors affiliated with the research group, also according to her/his attitude and interests. Courses cover topics about Health Care Management, Innovation in Health & Social Care, Accounting, Finance & Control, and Business Administration.</p> <p>There will be also the opportunity to be involved in the development of new educational programs both at the Master of Science level and the post-graduate level (jointly with POLIMI Graduate School of Management - GSOM). The selected PhD Student will have desk availability, even if the opportunity for smart working will be offered for two days per week.</p>