



# PhD in INGEGNERIA DELL'INFORMAZIONE / INFORMATION TECHNOLOGY - 40th cycle

Research Area n. 1 - Computer Science and Engineering

PNRR 629 PA Research Field: EXPLORING GENERATIVE AI IN HEALTHCARE FOR  
IMPROVING CLINICAL DECISION MAKING

<b>Monthly net income of PhDscholarship (max 36 months)</b>
<b>€ 1500.0</b>
In case of a change of the welfare rates during the three-year period, the amount could be modified.

<b>Context of the research activity</b>	
<b>Motivation and objectives of the research in this field</b>	Generative AI is advancing many fields in daily life and industry. However, today the application of Generative AI to real clinical cases is still underdeveloped, although it promises to deliver great results.
<b>Methods and techniques that will be developed and used to carry out the research</b>	The research program will focus on exploring and developing tools that leverage generative AI to enhance public patient care. Specifically, the student will explore the potential of generative AI for data augmentation to create: (a) Realistic datasets learned from patient data that can be used, shared, and aggregated with other datasets while preserving donor privacy; (b) More samples for rare (pathological) conditions, to improve the training of decision support systems; and (c) explore the potential consequences of a certain event (e.g., impairment of a biological function) to better understand human diseases. Finally, while state-of-the-art methods and algorithms for patient diagnosis are now capable of surpassing human performance, their application in real cases is hindered by a lack of trust in "black box" methods. The student will investigate the capabilities of generative AI for generating explanations, thereby enhancing trust in decision support systems.
<b>Educational objectives</b>	For a strong formation, the student will work in close



	collaboration with Buzzi Hospital to gain familiarity with real-world health data. The student will learn how these datasets are collected and manipulated to adhere to GDPR (General Data Protection Regulation) prescriptions and the requirements of clinicians for AI-based systems. In terms of technical skills, the student will learn advanced concepts in artificial intelligence and how to apply those concepts, algorithms, and methods to develop domain-specific information systems tailored to the needs of the clinical community.
<b>Job opportunities</b>	Academic research career in various fields related to data science, healthcare informatics, and artificial intelligence. Research and development team member in one of the many biomedical factories.
<b>Composition of the research group</b>	1 Full Professors 2 Associated Professors 6 Assistant Professors 5 PhD Students
<b>Name of the research directors</b>	Pietro Pinoli

<b>Contacts</b>	
pietro.pinoli@polimi.it - <a href="https://www.google.com/search?client=safari&amp;rls=en&amp;q=pietro+pinoli+polimi&amp;ie=UTF-8&amp;oe=UTF-8">https://www.google.com/search?client=safari&amp;rls=en&amp;q=pietro+pinoli+polimi&amp;ie=UTF-8&amp;oe=UTF-8</a>	

<b>Additional support - Financial aid per PhD student per year (gross amount)</b>	
<b>Housing - Foreign Students</b>	--
<b>Housing - Out-of-town residents (more than 80Km out of Milano)</b>	--

<b>Scholarship Increase for a period abroad</b>	
<b>Amount monthly</b>	750.0 €
<b>By number of months</b>	6

<b>National Operational Program for Research and Innovation</b>	
<b>Company where the candidate will attend the stage (name and brief description)</b>	Ospedale Pediatrico dei Bambini Vittore Buzzi
<b>By number of months at the company</b>	6
<b>Institution or company where the candidate will spend the period abroad (name and brief description)</b>	Fundació Sant Joan de Déu, Laboratory of Neurogenetics and Molecular Medicine, Institut de Recerca Sant Joan de Déu
<b>By number of months abroad</b>	6



**Additional information: educational activity, teaching assistantship, computer availability, desk availability, any other information**

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.

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:

1st year: Yes

2nd year: Yes

3rd year: Yes

CUP: D43C24001280001