



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

Research Area n. 1 - Computer Science and Engineering

**THEMATIC Research Field: REINFORCEMENT LEARNING METHODS FOR BEHAVIOURAL
CHANGES IN CANCER RISK REDUCTION**

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

Cancer has been a leading cause of death in the world since nearly 10 million people died of cancer in 2020. Research has shown that certain risk factors increase a person's chances of developing a variety of cancers, including the most diagnosed, i.e., lung, colorectal, prostate, and breast cancer. Such risk factors include those that cannot be controlled (e.g., age or family history), and those that could be modified, such as health behaviours and exposures to known environmental carcinogens. The PhD student will have the opportunity is to study and develop a data-driven behavioural change system designed to encourage and promote healthy and sustainable behaviours to empower citizens to adopt lifestyle habits that can reduce their risk of developing cancer. The student will collaborate closely with clinicians and researchers from diverse disciplines, fostering interdisciplinary research that combines computer science expertise with oncological insights to achieve comprehensive and practical solutions.

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

This research centers on the design of cutting-edge Reinforcement-learning-based algorithms specially crafted to tackle the unique challenges of data regarding behavioral changes for cancer risk reduction. The study will base the design of the system on the insights provided



	by publicly available datasets and will build on them to improve the capability of selecting the appropriate suggestion for the patient. The final method should be able to predicate on the typology of the behavioral change recommendation, on the frequency and the modality of communicating the suggestion.
Educational objectives	The PhD program in Information Technology offers advanced scientific training that enhances the research and problem-solving skills of doctoral candidates. The program focuses on both theoretical and experimental skills to foster high-level scientific competence. Upon completion, graduates will possess the ability to independently develop and execute original research, either by leading a research group or working collaboratively within a team.
Job opportunities	Being a joint work in the intersection of computer science and the medical field, the PhD will outcome in career opportunities in academia or the medical field, as the research program involves interdisciplinary knowledge in AI and health. Potential job opportunities include positions as a data scientist, AI engineer, or medical researcher, collaborating with medical centers to apply and refine the techniques developed during the PhD. The candidate may also consider pursuing a postdoctoral fellowship to continue research in the field or start their own research program.
Composition of the research group	1 Full Professors 1 Associated Professors 16 Assistant Professors 20 PhD Students
Name of the research directors	Francesco Trovò

Contacts	
francesco1.trovo@polimi.it, 0223994101, https://trovo.faculty.polimi.it/index.html	

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

List of Universities, Companies, Agencies and/or National or International Institutions that are cooperating in the research: IEO - Istituto Europeo di Oncologia

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 5707,20 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

The PhD is in the context of an HE project, iBeChange, whose goal is to develop a platform able to provide behavioural change suggestions to people to reduce cancer risk. The project started collecting data from existing European repositories and will continue collecting also data regarding real-world patients, which will be made available for processing in the PhD.