POLITECNICO DI MILANO

PhD in INGEGNERIA GESTIONALE / MANAGEMENT ENGINEERING - 41st cycle

THEMATIC Research Field: INVESTIGATING AND DESIGNING CRITICAL AI LITERACY INTERVENTIONS FOR YOUNG PEOPLE. A DESIGN-ORIENTED APPROACH TO EDUCATION AND TECHNOLOGICAL UNDERSTANDING

Monthly net income of PhDscholarship (max 36 months)
1500.0 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	Artificial intelligence (AI) increasingly shapes daily life—from personalised content and algorithmic decision-making to identity and social interaction. Yet public understanding of how AI works, its limitations, and its social consequences remains limited. This “AI literacy gap” particularly affects marginalised communities—those most exposed to algorithmic bias, exclusion, and harm—while leaving them without tools to question or reshape the systems that impact them. This PhD explores how design-led educational interventions, developed with and for young people, can promote critical awareness, ethical engagement, and creative agency around AI. Unlike traditional AI ethics initiatives focused on technical fixes, this project centres lived experience, critical reflection, and participatory learning—especially for those most affected by AI’s embedded biases. Because AI often operates as an opaque “black box,” the stereotypes it encodes can perpetuate inequality. By equipping young people to interpret, critique, and reimagine AI, this research aims to close the literacy gap and support more equitable, accountable technological futures. The PhD candidate will: - Design and evaluate educational activities such as workshops, toolkits, speculative design tasks, and critical making practices

	- Explore how young people perceive and respond to AI, including fairness, bias, privacy, and representation - Examine how participatory and creative formats support critical thinking, ethical reasoning, and technological agency - Engage young people in co-design processes to ensure cultural relevance and reflection of lived experience - Study how interventions influence understanding of AI and ability to navigate algorithmic systems. Grounded in Human-Computer Interaction, the research will generate both theoretical insights into how people make sense of AI bias and practical tools that foster community-driven accountability in automated systems. This opportunity suits applicants with backgrounds in: - Human-Computer Interaction - Computer Science or Informatics - Design (interaction, educational, or speculative) - Education or Learning Sciences - Youth Studies or Digital Psychology. Candidates should be interested in co-design, exploring the ethical and cultural dimensions of technology, and working across disciplines to advance inclusive, socially responsible AI futures.
Methods and techniques that will be developed and used to carry out the research	The research will be grounded in design research methodologies such as participatory design, and constructive inquiry, combined with educational frameworks from critical pedagogy, socio-cultural learning theory, and media literacy. The research will be based on a mixed-methods approach: - Quantitative: pre/post surveys (technology acceptance, self-efficacy, wellbeing scales), systemlog analysis (adoption rates, error frequencies), and network performance metrics. - Qualitative: thematic analysis of interviews and focus groups to uncover latent concerns, emerging best practices, and longterm cultural shifts. The research will include several steps, including: - State-of-the-Art (e.g. scoping literature review) - Development of multiple Case studies (e.g. Ethnographic observation, semi-structured interviews, focus group)

	- AI Prototype and Digital-Literacy Intervention Design, Development and Evaluation. This project will bridge the gap between technological understanding and social empowerment by: - Identify Gaps in AI Literacy and Uncovering Algorithmic Social Biases in Context. Systematically mapping how different demographic groups (e.g., by race, gender identity, socioeconomic status) conceptualize AI, what misconceptions they hold. - Co-designing critical thinking Interventions. Co-create with community partners interactive curricula and digital tools that guide users through deconstructing algorithmic decisions—exposing bias sources, ethical dilemmas, and power asymmetries. - Measuring Empowerment and Justice Outcomes. Evaluate how AI-literacy interventions shift users' self-efficacy to question automated decisions, engage in public dialogues, and influence policy or design practices toward greater transparency and fairness.
Educational objectives	By bringing together design practice and educational inquiry, this PhD aims to create novel interventions that not only teach about AI, but challenge how it is experienced, understood, and imagined. The goal is to empower young people to critically engage with AI, question its influence on their lives, and envision alternatives that reflect their values and aspirations. - Acquire/Deepen expertise in HCI and human factors area of research - Develop Participatory Design &HCI Skills: co-design techniques, rapid prototyping (paper, Wizardof-Oz, digital), formative usability testing, and accessibility best practices. - Develop scientific writing and dissemination abilities through publishing in premier venues (e.g., CHI, DIS, Transactions on HCI), presenting at industry conferences, and leading stakeholder workshops. - Cultivate Critical Pedagogy &Facilitation Abilities: Acquire methods for designing and leading transformative educational experiences grounded in critical theory and social justice. - Engage in interdisciplinary collaboration, working

	alongside Politecnico faculty in Human Tech, ergonomics, and transport engineering, as well as external partners
Job opportunities	The successful completion of the PhD program will open several job opportunities in both academia and companies, in research, consulting and managerial roles. The candidate will develop distinctive knowledge to master the key managerial activities and decisions in the arena of natural resource management.
Composition of the research group	1 Full Professors 1 Associated Professors 0 Assistant Professors 0 PhD Students
Name of the research directors	E. Rubegni, G. Micheli, P. Trucco

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	750.0 €
By number of months	6

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

There is an available desk in the department.

For the overall development of their capabilities, PhD candidates will work on sinergical projects to favour empirical data collection and network development for their career. Projects will give candidates the opportunity to work in groups (peers and other senior professors).

If coherent with the development of their doctoral program, the PhD candidate will have the opportunity to be involved in: teaching activities, tutoring to master students, tutoring to PhD candidates for administrative processes.

Funding for educational activities: 6.100,00 Euros for three years.