POLITECNICO DI MILANO

PhD in DESIGN - 41st cycle

Number of scholarship offered	7
Department	DIPARTIMENTO DI DESIGN

Description of the PhD Programme

General descriptionDescription of the PhD Programme

Detailed information on research proposals to be developed for Ph.D application is available at: http://phd.design.polimi.it/

The PhD Program in Design prepares designer-researchers who, addressing the problems and opportunities of contemporary society, are able to apply research methods to produce original design knowledge. The curriculum lasts three years, during which both training and research activities are provided. The Program develops analytical and design abilities and promotes a collaborative disposition.

The complete list of research proposals is avaliable at: http://phd.design.polimi.it/

Once enrolled, each candidate becomes an effective member of a research group, within which she/he develops an original research project. This research activity is the fundamental core of the learning process. Parallel to this, each candidate is involved in other educational activities.

Proposing department: Department of Design.

Other involved departments: Department of Mechanical Engineering; Department of Chemistry, Materials and Chemical Engineering.

Scholarships: More details on the scholarships offered by the PhD Program in Design are available on page 2 of this document. The specific research subject will be assigned to each candidate within the first months of the PhD activity, with the agreement of both the candidate and the Board of Professors of the PhD Program.The number of available scholarships may be increased up to completion of the evaluation process.

	_ How generative AI can create dynamic, context-aware automotive interfaces that learn from user interactions _ Methodologies for designing adaptive interfaces across varying levels of vehicle autonomy _ Integration of multimodal interaction patterns (voice, gesture, haptic) with visual interfaces _ Tools for rapid prototyping, testing, and evaluation of AI-driven automotive interfaces _ Inclusive design principles ensuring accessibility for diverse user groups By bridging theoretical frameworks with practical implementation strategies, this research will advance automotive interface design while addressing human-machine interaction challenges in increasingly autonomous vehicles.
Methods and techniques that will be developed and used to carry out the research	The research methodology will adopt a mixed-methods approach within an action-research framework, combining theoretical exploration with practical application in real-world contexts. Foundation and Exploration Phase: _ Comprehensive literature review covering automotive UX, generative AI in interface design, and human factors in autonomous vehicles _ Competitive analysis of current automotive interfaces across manufacturers and autonomy levels Expert interviews with automotive designers, UX professionals, and engineers _ Observational studies of users interacting with current automotive interfaces Framework Development Phase: _ Creation of a theoretical framework for adaptive automotive interfaces across autonomy levels _ Development of design principles and guidelines for generative UI in automotive contexts _ Establishment of evaluation metrics for assessing

	automotive user experiences _ Definition of methodologies for prototyping and testing generative interfaces Prototyping and Validation Phase: _ Design and development of prototype interfaces implementing the framework _ Laboratory testing using driving simulators to evaluate interactions _ Field testing in real vehicles (where possible) or advanced simulation environments _ Iterative refinement based on user feedback and performance metrics Integration and Dissemination Phase: _ Integration of findings into comprehensive design guidelines and tools _ Development of practical implementation strategies for automotive manufacturers _ Academic publication and industry dissemination of research findings Throughout all phases, the research will involve different stakeholders including automotive designers, engineers, UX professionals, and potential users through collaborative workshops and co-design sessions. The research will utilize state-of-the-art tools including advanced prototyping tools, eye-tracking and biometric measurement, machine learning tools, and high-fidelity driving simulators.
Educational objectives	The educational objectives of this doctoral project aim to develop a professionally versatile researcher capable of bridging theoretical knowledge with practical application in the evolving field of automotive user experience design: Research Competencies: _ Mastery of research methodologies relevant to UX design, HCI, and automotive interfaces _ Development of critical analytical skills for evaluating technological innovation _ Ability to design and conduct complex user studies in

	technological environments Technical Expertise: _ Proficiency in prototyping tools and methodologies for automotive interfaces _ Understanding of AI and machine learning applications in user interface design _ Knowledge of technical constraints and opportunities in automotive digital systems Design Leadership Skills: _ Ability to lead cross-functional teams in complex design challenges _ Capacity to translate research insights into actionable design strategies _ Skills in communicating complex technological concepts to diverse stakeholders Industry Knowledge: _ Understanding of automotive industry trends and technological roadmaps _ Awareness of regulatory frameworks affecting automotive interface design _ Familiarity with production constraints and implementation requirements The educational path will combine structured academic learning with hands-on experience in both academic and industrial settings, ensuring that the researcher develops as both a scholarly contributor and a practical innovator, capable of addressing the complex challenges of designing user experiences for next-generation vehicles.
Job opportunities	The interdisciplinary nature of this research project positions the PhD graduate for various high-demand career paths in both industry and academia: In the automotive industry: •UX Research Director or Lead UX Strategist at major automotive manufacturers •Innovation Manager specializing in digital experiences

	and interface design •Technical Product Manager for in-vehicle digital systems •Chief Experience Officer (CXO) focusing on next-generation mobility experiences In the technology sector: •Experience Design Lead for mobility platforms and services •AI Experience Designer specializing in intelligent interface systems •Consultant for digital transformation in mobility and transportation •Innovation Strategist for technology companies entering the mobility space In academia and research: •Research Professor specializing in automotive experience design •Principal Investigator for research programs on human-autonomy interaction •Director of automotive innovation labs or mobility research centers In entrepreneurial contexts: •Founder of startups focused on next-generation automotive interfaces •Developer of innovative aftermarket solutions for vehicle experience enhancement •Creator of specialized design studios focusing on mobility experience The acquired expertise in combining design thinking, technological innovation, and user-centered methodologies provides a unique professional profile that bridges multiple disciplines, making the graduate highly valuable in an industry increasingly defined by experience rather than mechanical specifications alone.

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OPEN SUBJECT Research Field: DESIGN

Monthly net income of PhDscholarship (max 36 months)
€ 1300.0 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	Research in the field of design is aimed at improving design processes and practices, with the final aim of developing domain-specific knowledge. It includes several forms of research, like research-based design practice, research through design, and research into design. It allows investigating new phenomena and technologies connected to emerging user behaviors and sociocultural models, in order to anticipate future scenarios. The overall goal is exploring research fields where design is applied at different scales and complexity degrees to people, organizations, communities and social entities. For a list of research topics proposed by the Design Department Faculty members, please visit: http://phd.design.polimi.it/
Methods and techniques that will be developed and used to carry out the research	Different methods and approaches (e.g. historical research, experimental approach; actionresearch; meta-design; critical analysis; case study and scenario design) are being used to carry out research in the various fields of design. A multidisciplinary integration and humancentered and participated design processes will be encouraged.
Educational objectives	The learning process is based on theoretical studies linked with practical activities to enhance the skills necessary to act also as a design practitioner. The overall aim is educating design researchers with a specific attitude in exploring and devising forms of innovation able to generate value for the society, the 1 / 2 economy and the environment.

Job opportunities	The main request will come from companies, institutions, social and public bodies, NGOs and design firms looking for a design researcher able to interact with other professionals in research and innovation.
Composition of the research group	8 Full Professors 20 Associated Professors 2 Assistant Professors 92 PhD Students
Name of the research directors	LUCIA ELENA RAMPINO

Contacts
E-mail address: segreteriadottorato-design@polimi.it http://phd.design.polimi.it/

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	650.0 €
By number of months	6

Stage and period abroad	
Institution or company where the candidate will spend the period abroad (name and brief description)	
By number of months abroad	0

Additional information: educational activity, teaching assistantship, computer availability, desk availability, any other information
Educational activities (purchase of study books and material, funding for participation in courses, summer schools, workshops and conferences) financial aid per PhD student per year: max 5.300,25 euros per student (total for 3 years) Teaching assistantship: availability of funding in recognition of supporting teaching activities by the PhD student. There are various forms of financial aid both for research and teaching activities. The PhD student is encouraged to take part in these activities, within the limits allowed by the regulations. Computer availability: 1st year, 2nd year and 3rd year: Each research group may supply phd

student with a desk, if necessary.

Desk availability: 1st year, 2nd year and 3rd year: Each research group may supply phd student with a desk.