

# RESEARCH THEME

XXXIX cycle – a.y. 2023/2024

**Title of the doctoral research**

Generative AIs and computational approaches in Communication Design

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**Proponent professor**

Marco Quaggiotto

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**Abstract**

In the context of digital transformation, the transformation of practices, tools, media and communication systems has had a significant impact on communication design, both in terms of its tools and methods. As a general trend, advances in information technologies, smart supports, and the more recent revolution brought about by machine learning technologies are pushing visual and communication design towards new scenarios with a strong presence of systems that operate either in support of human designers or autonomously in the context of smart devices.

In this latest digital transformation, communication design, which has long been *computer-aided*, is becoming increasingly *computational*: new dynamic contexts, in which the relationships between content and representation can no longer be statically defined, require new methodologies that allow for the description of communication design artifacts in terms of systems, processes and models that manage this translation.

In this research framework, the current theme aims to explore the possible interactions between the abductive sensemaking process of design and the logic-deductive skills of computational thinking, with the aim of investigating areas related to: the impact of digital supports and technologies on communication design skills and educational strategies; the potential of computational methods to address design challenges in dynamic media, supports and content; the implications of generative AI and large language models for communication design practice and education; the skills that the next generation of designers will need to effectively use these technologies in their work.

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**Keywords**

communication design, computational design, generative AI.

# RESEARCH THEME

XXXIX cycle – a.y. 2023/2024

**Title of the doctoral research** A framework for Policy making for Cultural and Creative Sectors and Industries (CCSI)

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**Proponent professor** Valentina Auricchio

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**Abstract**

As culture is a primary source of behavioral change, Cultural and Creative Industries (CCI) play a key role in transformative challenges acting as change initiators. The research intends to explore the role of CCI in leading to more inclusive, green, and digitized innovations and how this role can be supported by new policies.

Policies for collaborative innovation are still needed for CCI to thrive in innovation ecosystems, to be able to support cross-innovation and to drive innovation solving grand challenges (notably Green Deal and Digital transformation).

The methodology will be based on the interpretation of data in a participatory, open innovation way with key stakeholders, and iteratively exploring and mapping needs through generative workshops, and it will be grounded in iterative collaborative processes.

The final aim of the research will be to provide a framework for the fragmented small and medium sized CCI players to be better represented at the policy level, and to strengthen their potential to initiate innovative transitions.

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**Keywords** Policy Making, Cultural and Creative Industries, Innovation ecosystems

# RESEARCH THEME

XXXIX cycle – a.y. 2023/2024

**Title of the doctoral research**

Olfactive Design. The birth of a discipline

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**Proponent professor**

Anna BARBARA

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**Abstract**

Space and smell are interconnected. Air travels through space by osmosis, humidity, temperature, pressure difference, but also because materials, shape, arrangement of openings, ventilation systems (natural and forced) move this element to our nostrils.

Odours are linked to places as well as to nature, divinity, disease, sex, food, the everyday, the extraordinary, the evanescent, memory, the brain.

The 'design of the invisible', linked to the sense of smell, is not a monopoly of the perfume industry, but to design in its most complex forms: in the design of spaces, products, performance, services, interaction design, emotions, neural interactions with our neurological, psychological and physiological systems.

Olfactive design, and all its ramifications, also belongs to Architects, Designers, Anthropologists, Sociologists, Psychologists, Neuroscientists.

Olfactive Design is a discipline in its infancy. Researchers all over the world are working on it, but there is still no consistent discipline that brings together this knowledge and systematically investigates what it can bring to the design disciplines.

Research could investigate the olfactory territories of places, objects and materials, including its historical evolution, imagining new scenarios, creating new experiences, in one of the least explored and least exciting fields of design ever.

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**Keywords**

“Olfactive”, “design”, “spaces”

# RESEARCH THEME

XXXIX cycle – a.y. 2023/2024

**Title of the doctoral research**

FROM VISUAL CULTURE TO NEW BOUNDARIES FOR COMMUNICATION DESIGN EDUCATION

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**Proponent professor**

Valeria Bucchetti

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**Abstract**

The research field relates the Visual Culture field – studies on Visual Culture (Bredekamp, H. 2015; Mitchell, W.J.T., 2017) that are defined by the attention paid to the 'practices of seeing' – with Basic Design, and its developments (Anceschi, G.,2010), as a form of didactic learning based on a set of foundations of Configuration Theory.

We want to investigate the developments of educational processes of Communication Design in the light of the transformations that have characterized the design area and which see the 'iconic act' immersed in a constant evolutionary process. It is a question of investigating new models for literacy in the social use of images to be placed at the basis of the training of the communication designer. In particular, considering the multiple factors underlying the transformations of the communicative context which require a strengthening of the theoretical tools. From hypervisibility, which sees the power of visibility besieged by itself in which density and pervasiveness, thanks also to the network that has redistributed and expanded the 'space' of vision, produce the phenomenon of image overload; to the democratization of digital technologies that have changed both the design and production processes of communicative artifacts, and the teaching methodologies through which to learn them, up to the most advanced forms of applications of generative computing and the AI image generator.

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**Keywords**

Visual Culture, Configuration Theory, Communication Design Education

# RESEARCH THEME

XXXIX cycle – a.y. 2023/2024

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Title of the doctoral research

Italian Typography Redefined: the Nebiolo Type Foundry, 1852–1978

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Proponent professor

Alessandro Colizzi

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Abstract

Founded in Turin in 1852, Nebiolo was Italy's most important manufacturer of foundry type and printing presses, both in terms of market share and international reputation. Thanks to its Art Studio, headed by distinguished designers such as Raffaello Bertieri, Giulio Da Milano, Alessandro Butti and Aldo Novarese, throughout the 20th-century Nebiolo created highly influential typefaces – including *Semplicità*, *Neon*, *Landi*, *Hostile*, *Augustea*, *Garaldus*, *Recta*, *Eurostile*, *Forma*, *Stop*. More than four decades have elapsed since the foundry's closure in 1978: due to the dispersion of the company's archives, the lack of primary sources hampered research, and despite its importance, a history of the foundry has yet to be written. Yet, Nebiolo remains a key reference in Italian and European graphic design, and its legacy is highly relevant.

The research group Nebiolo History Project (Marta Bernstein, James Clough, Alessandro Colizzi, Riccardo De Franceschi, Massimo Gonzato, Riccardo Olocco) is actively trying to fill the gap in order to produce a scholarly publication about the Nebiolo foundry. Using methodologies that integrate documentary evidence and oral history testimonies, the research involves systematical collection and collation of data, in order to provide a complete, cross-checked background which is key to a proper critical assessment.

The research is ongoing and open to new paths. In addressing Nebiolo's heritage, the goal is to transcend disciplinary, national or period boundaries. Topics we are keen to explore include (but are not limited to): business and/or cultural relations with American and European foundries; the company's industrial history; the factory organization; the role of lesser-known figures within the company; the technical workflow at the Studio artistico; discernible trends in the company's type catalogue; the relevance of non-Latin scripts; the history and evolution of their printing presses. Research proposals can focus on archival materials, data analysis, oral history, or a critical assessment of any aspect of the history of the Turin foundry.

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Keywords

Typeface technology, Typography, Printing

# RESEARCH THEME

XXXIX cycle – a.y. 2023/2024

**Title of the doctoral research** Development & modeling of sustainable 3D auxetic fabrics having smart properties

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**Proponent professor** Giovanni Maria Conti

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## Abstract

Common opinion holds that the fashion business is second only to the oil sector when it comes to environmental damage. European Union officials have launched the European Clothing Action Plan to increase the longevity of textiles from their production to their eventual disposal. Landfilling of unwanted textiles has emerged as a major issue around the world. The textile and fashion industries can become far more sustainable if every firm in the supply chain for clothes adopts environmentally friendly procedures.

Rapid progress in the field of auxetic materials has been made in recent years. Numerous auxetic materials, such as fibers, yarn, textiles, foams, composites, metals, ceramics, etc., have been found, created, or studied. It's been suggested that auxetic materials could be used in a wide variety of ways, but so yet, their actual uses have been rather few and few between [2]–[4]. The focus of this research will be on creating novel textile based sustainable auxetic structures with practical use. Auxetic materials are expected to become increasingly prevalent in a variety of fields, including textiles, aerospace, and biomedicine.

Only a few auxetic fabrics have been created, and they aren't exactly ready for usage in clothing just yet. A significant difficulty for textile experts is the creation of auxetic fabrics using non-auxetic yarns. In order to make the most of this innovative textile-based material, further systematic research into auxetic materials is needed. One of the most crucial areas for development is ensuring that auxetic materials retain their auxetic effect after being washed and reused.

This study will develop a new textile based auxetic structures from textile waste, and a model of textile based auxetic structures will be created, making it easier to advance in this field in the future.

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**Keywords** Knitwear, Sustainability, Smart structures, Auxetic knitted fabrics,

# RESEARCH THEME

XXXIX cycle – a.y. 2023/2024

**Title of the doctoral research**

COMPUTATIONAL DESIGN FOR SUSTAINABLE DEVELOPMENT

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**Proponent professor**

Fiammetta Costa

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**Abstract**

The research theme arises at the intersection between digital technologies of computational nature and ecological/social sustainability. The reference context for the research is computational design, understood as the design process that, taking advantage of the potential of computation, integrates digital emerging technologies in the development of responsive systems.

In this context, user and environmental data can drive a transition from descriptive to generative approaches establishing an unprecedented feedback loop in design research and practice. The opportunity is mainly due to the enabling possibilities of technologies to interact with the context: data can encode information and become a source to simulate behaviors, prefigure and perform adaptive outcomes. Moreover, this relationship (environment and design) is not limited to resources/energy management but draws forms of an artificial ecology (bio-digital integrated systems) as an expression of a new alliance between design and nature.

The proposal aims to develop original knowledge in the interdisciplinary field of interaction design and sustainable transition, taking advantage of computational design tools.

It addresses emerging questions in design practice and research, such as:

- How can bio-digital integrated systems support biodiversity and interaction at individual and community level?
  - How can parametric codes and data address this challenge?
  - How can social, technological, and environmental issues be integrated into sustainable development through computational design?
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**Keywords**

Digital technologies, sustainable transition, design by data

# RESEARCH THEME

XXXIX cycle – a.y. 2023/2024

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<b>Title of the doctoral research</b>	<b>Cities in the Ecological Transition: designing innovative scenarios for new urban ecosystems.</b>
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<b>Proponent professor</b>	<b>Barbara Di Prete</b>
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**Abstract**

The ecological transition represents both a challenge and an urgency for the contemporary world, confronted with a 'poly-crisis' caused by multiple factors, including environmental changes and the international geopolitical context. The UN Sustainable Development Goals, the more recent European Green Deal, and the UN Climate Change Conference (COP27, 2022) all aim to promote new economic and behavioral models, addressing an unprecedented complexity of energetic, environmental, productive, and social aspects, with the aim of achieving climate neutrality by 2050.

In this context, urban development is considered a strategic issue, as a smart management of the city's metabolic dimension could lower its ecological and environmental impact. Such a dimension pertains to the functioning of complex, multi-scalar, and multi-dimensional processes, which require a systemic approach: in promoting a virtuous ecological transition, in fact, it is essential to actively involve policy-makers and economic-productive players, but it is also necessary to re-orient personal choices, engaging the citizenry. In complementarity with other disciplines, design can play a crucial role in fostering the development of innovative urban ecosystem models.

The research will focus on such sustainable scenarios involving the relationship between built and natural systems, public and private, technological and behavioral dimensions.

The research's main expected outputs are the definition of interpretation and assessment models of possible actions in the urban sphere and the development of guidelines to orient their future design.

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<b>Keywords</b>	<b>Urban spaces; Design for Climate change; eco-design; Sustainable design solutions</b>
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# RESEARCH THEME

XXXIX cycle – a.y. 2023/2024

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**Title of the doctoral research**                      Designing against food waste and poverty. Innovative strategies, methods and processes in community-based systems.

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**Proponent professor**                              Davide Fassi

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**Abstract**

The political, environmental, and economic crisis has brought to the forefront a general increase in both food poverty and food waste with diversified impacts on a social level. This issue, which has been compounded by the recent pandemic, has not only affected developing and low-income countries but also developed middle-income nations. Design for Social Innovation can contribute to guarantee equitable access to food by intervening in the systems of relationships by testing bottom-up and localized initiatives with situated communities. As indicated by the Sustainable Developments Goals number 1 (No poverty), 2 (Zero hunger), 11 (Sustainable cities and communities) and 12 (Responsible consumption and production) by the United Nations, the matter at hand has been deemed of crucial importance in the pursuit of a more equitable and just world. Within this context, the objective of this proposal is to explore both existing and innovative models for addressing current food and social needs, with a particular focus on the potential role of Space and Service Design and Systemic Design methods and tools. In particular, the proposal aims to investigate how design-driven strategies can help to:

- support short-range food management systems;
- foster the developments of a network of proactive actors for the management of food flows;
- enhance civic engagement for the fight against hunger and food waste;
- design a context-based service to help communities in need;
- understand the implications and impact of these flows considering the complexities of such systems.

In analyzing this topic, it is important to give special consideration to the spatial dimension, particularly with respect to the rising and pivotal function of neighbourhood hubs as places for the activation of these processes.

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**Keywords**    Design for social innovation, design against food poverty and waste, spaces and services.

# RESEARCH THEME

XXXIX cycle – a.y. 2023/2024

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<b>Title of the doctoral research</b>	Exploring new ways to combine the potential of Design with Craft
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<b>Proponent professor</b>	Marinella Ferrara
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## Abstract

In the last decades, designers' and consumers' interest in craft, self-production, and the maker culture has grown in Europe, USA, Asia, and Arab Countries as well, for many different reasons, showing different expressions (from didactic to professionalism). In post-industrial economies a re-evaluation of crafts is functional with the rise of the creative economy. Craft practices are valuable agents in rethinking of the contribution of design to our society. In other contexts, losing artisan knowledge threatens the legacy that goes beyond the boundaries of the economy of a country: it builds its cultural identity.

In a globalized environment a craft attitude can focus on a particular relationship between craft-based methodologies and the capability of digital design and rapid manufacturing, overcoming the historical incompatibility of craft with the economic constraints imposed by the mass manufacturing of 20th century industrial production, thanks to information communication technologies.

This line of research will explore ways to build new relationships between design and craft with promising combinations in economic terms as well as social innovation and sustainability. It implies the case studies of cultural institutions working on the preservation of traditional knowhow, and research on methods to exploit the potential for innovative digital craft production and develop economically viable small- or large- scale production methods in relation to market needs.

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## Keywords

Craft re-evaluation, maker culture & creative economy, rapid manufacturing

# RESEARCH THEME

XXXIX cycle – a.y. 2023/2024

**Title of the doctoral research**

Circular material and design strategies for sustainable production

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**Proponent professor**

Marinella Ferrara

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**Abstract**

The core of the research is the development of new circular waste-based biomaterials and the definition of design strategies for the application in circular design concepts as to combine design for sustainability to Circular Economy

(CE) approach with decarbonization challenges. The project is built around 3 interconnected research pillars:

- 1) What is the role of design in contributing to a transition toward a CE?
- 2) How can design support productive reconversion for a more innovative and sustainable territorial economy?
- 3) How can local communities contribute to leveraging green technologies and what is the impact of such technologies on the territorial productions and identities of territories?

The challenge of the research is to develop effective methods and concrete tools to enable territorial dynamics toward sustainable development and support a transition toward a CE. A mix of theoretical and practical activities will be carried to co-design virtuous processes for the recirculation of local resources (materials and waste) in territorial production chains, their transformation and re-use in design of “circular material and products”. The re-use of local material resources in the territorial production systems will make a pair with the identity representation of the communities themselves, offering a new ransom opportunity towards a conscious updating of material culture practices in a sustainable, synergic, and inclusive perspective.

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**Keywords**

New sustainable Materials, Circular Economy, Regeneration of territory

# RESEARCH THEME

XXXIX cycle – a.y. 2023/2024

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**Title of the doctoral research**

Data Physicalization: Use materials as means for interacting with big data.

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**Proponent professor**

Venere Ferraro- (co-proponent Valentina Rognoli)

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**Abstract**

We are living in a world imbued with data. Humans are deeply entangled with data generation, collection, and expression processes, both in the digital and physical realms. Information and communication technologies (ICT) is boosting these processes, allowing machines to sense, capture, and generate an enormous amount of data daily.

Most of the time, data are perceived as objective, cold and non-manipulable pieces of information, somehow existing far away from people's daily experiences. Whether data describes financial events, environmental phenomena, climate, health indicators, datasets are often presented as numbers, impossible to feel, touch and emotionally engage with.

The ongoing *datafication* of reality and pervasiveness of big data propose a relevant research opportunity on how data can be approached as a *shapeable material for design*. Placed in Human-Computer Interaction (HCI) domain, *data physicalization* is defined as encoding data in physical artefacts and materials. Data can thus be expressed through physical objects and materials that facilitate interaction modalities and channels. *Data physicalization* could envision alternative ways on how data can be used to shape meaningful and embodied experiences. The research will largely explore diverse *materials* to represent and communicate data, specifically looking at *Interactive Connected Smart* (ICS) materials and *Hybrid Material Systems* (HMS) through material tinkering. The research will investigate how communicating data through materials, and physical artefacts could support people in understanding those data and mediate complex phenomena.

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**Keywords**

*Human-Data Interaction, Speculation, Material Design, Material crafting*

# RESEARCH THEME

XXXIX cycle – a.y. 2023/2024

**Title of the doctoral research**

Rethinking the role of the Arts in Design Culture

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**Proponent professor**

Luca Guerrini

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**Abstract**

The disciplines of art and design are going through a period of substantial transformation. If the increasing complexity of contextual conditions pushes design towards new fields of research and action, then reflection and production in the field of art appear equally varied.

The study originates from the awareness that this new condition questions, and therefore redesigns their mutual relations. Moreover, it acknowledges the vocation of both art and design, to verify and overcome their disciplinary limits, in search of relationships and comparisons with other fields. This vocation demonstrates how innovation actually resides in the contiguous territories: where skills mix, margins fade and paths intertwine, research finds fertile ground for development.

The study aims to explore issues such as:

\_ What are the areas in which art and design can still collaborate in generating visions, environments, objects and services?

\_ What are the themes that this renewed collaboration can address, in light of the changed social and market conditions?

\_ What are the methods and tools for this interaction in design research and practice? Providing answers to these questions sets an ambitious goal. First of all, it is necessary to draw a map of the reciprocal new relations between art and design, starting with identifying a series of specific in-depth studies, each of which can motivate an entire doctoral research. To this effect, the research proposes a long-term program, divided into phases, with the contribution of several researchers.

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**Keywords**

visual and performing arts, reflective practice, design theory

# RESEARCH THEME

XXXIX cycle – a.y. 2023/2024

**Title of the doctoral research** Patient-centeredness and empowered patientship.  
Hacking the systems of care

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**Proponent professor** Stefano Maffei

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## Abstract

Patient-centeredness is increasingly recognized as a critical element in the delivery of high-quality healthcare. Patients are no longer viewed as passive recipients of care but as active partners who can contribute to the co-design of healthcare services and the development of innovative solutions. This Ph.D. research aims to investigate the role of patient-centeredness and patient innovation in healthcare through a human-centered design approach.

The research objectives are:

- to understand the concept of patient-centeredness and patient innovation in healthcare;
- to identify the challenges and opportunities associated with implementing patient-centeredness and patient innovation in healthcare;
- to explore the role of human-centered design approaches in developing patient-centered healthcare services and products;
- to evaluate the impact of patient-centered healthcare services and products on patient outcomes, satisfaction, and experiences;
- to develop a framework for designing patient-centered healthcare services and products.

The research will adopt a mixed-methods approach. A qualitative study will be conducted to understand the concept of patient-centeredness and patient innovation in healthcare. A survey will be used to collect data on the challenges and opportunities associated with implementing patient-centeredness and patient innovation in healthcare. We will use an exploratory design framework approach to develop and evaluate patient-centered healthcare services and products. Finally, we will conduct a case study analysis to assess the impact of the expanded patient-centered healthcare services and products on patient outcomes, satisfaction, and experiences.

The expected outcomes of this research include a deeper understanding of the role of patient-centricity and patient innovation in healthcare, a framework for designing patient-centered healthcare services and products, and recommendations for healthcare organizations on implementing patient-centricity in healthcare effectively.

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## Keywords

Patient-centricity, systems of care, patient innovation

# RESEARCH THEME

XXXIX cycle – a.y. 2023/2024

**Title of the doctoral research**

Visual exploration of digital archives

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**Proponent professor**

Michele Mauri

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**Abstract**

Over the past few decades, there has been a growing trend towards digitizing various types of archives, including historical, cultural, and corporate archives. This has been accompanied by the emergence of born-digital data, such as social media interactions and historical copies of websites, which present both challenges and opportunities. The development of digital solutions for facilitating access to archives has raised concerns about longevity, i.e., how to design digital solutions that endure over time and how to develop processes that facilitate the conservation and maintenance of interfaces. In addition, the exploration of archives through visual means is being impacted by the rise of machine learning and Artificial Intelligence technologies: how can approaches coming from those fields enable a new way to curate and experience the content of digital or digitized archives? Finally, having today an advanced state of the art on technologies and methods for the creation of digital surrogates, an increasing number of organizations are reflecting on the digitization of their collections. Designers frequently find themselves in a situation where the archive they are working with has not yet been digitized. However, they still need to come up with ideas and strategies for making the archive accessible and usable. The Ph.D. candidate will address these critical issues by working on applied projects, designing and prototyping possible solutions, and collaborating with experts from other fields.

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**Keywords**

Information visualization, data visualization, digital archives

# RESEARCH THEME

XXXIX cycle – a.y. 2023/2024

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**Title of the doctoral research** Creativity places for the enhancement of the territory. Interdisciplinary analysis to develop the environment through the network of cultural and creative spaces.  
The case study of Pavia district.

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**Proponent professor** Anna Mazzanti

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**Abstract**

The objectives of the proposed research will concern the role of contemporary culture and creativity places for the enhancement of the territory. Examining and comparing best practices at a national and international level will allow for the formulation of a theoretical and methodological definition of the phenomenon, in the light of the most recent declinations of the theme, through the analysis and storytelling tools of design and art criticism.

The best practices of cohesion between the places of contemporary culture and creativity and the context, understood as physical and social space, will be examined proceeding through mapping, taxonomic study, critical analysis and by highlighting peculiarities. A key aspect of the research project is to enhancing the territory, understood as a set of identities, relationships, sociality, through the networking of contemporary culture and creativity places. It will be analyzed the case study of Pavia never studied before by this focus. To address the underlying question, an interdisciplinary, systematic and typological analysis is necessary, and it will be carried out from the point of view of art-historical criticism, museology and design, understood in its interpretative and narrative role. Through this approach, the project aims at enhancing the identity of places and proposing new guidelines and development scenarios, also leveraging the potential offered by mobile technologies for the communication and dissemination of content.

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**Keywords** network for spaces of creativity, territory enhancement, interdisciplinarity between art and design



# RESEARCH THEME

XXXIX cycle – a.y. 2023/2024

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**Title of the doctoral research**                      Designing quality public services. The challenge to provide quality and meaningful user engagements and experiences when it comes to public and social services.

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**Proponent professor**                              Anna Meroni

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**Abstract**    Service design is progressively entering all areas of the public sector, transforming the culture and approach to service delivery on the one hand, and user behavior and experience on the other.

Researchers point out that design still lacks an understanding of the nature of the public sector in terms of the complexity of its institutional aspects. However, this is not the only deficiency: in fact, we can argue that the understanding of how to provide user-centered design that can lead to meaningful and quality engagements and user experiences is also still lacking, even more so when it comes to hybrid service journeys and encounters.

The research program aims to investigate, through primary/secondary and applied research, the approaches, frameworks, and directions that design can take to achieve quality and sustainability when it comes to services that: i) target a broad population; ii) aim to fulfill rights or duties; iii) are related to co-production and user participation; iv) aim to address social needs; and v) aspire to commoning and to produce public value.

The goal of the program is to outline a knowledge base that can inform service design practice on the specifics of usability, aesthetics, affordance, meaning, performativity, interaction, and sustainability of public services.

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**Keywords**    Service design, Public services, Service aesthetics

# RESEARCH THEME

XXXIX cycle – a.y. 2023/2024

**Title of the doctoral research** Avatars and human digital twins: exploring the multiple opportunities and folds of digital personal representations in real world and the Metaverses

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**Proponent professor** Margherita Pillan

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**Abstract** Virtual worlds allow for immersive interactions and collaboration, evolving from virtual reality and the internet. Their development can transform how we work, socialize, and live our lives, offering benefits in increased social connection, collaboration, health care, education, training, entertainment, and economic opportunities. Avatars are digital representations of users; they can be customized to reflect their identity, appearance, personality, and preferences. Avatars can also reflect the creative interpretation of personal identity, allowing users to express themselves and explore experiences in the virtual world outside of the boundaries of physical resemblance. Human digital twins are based on data collection and mathematical modeling of personal characteristics; they have multiple potential applications, from the tailored production of products to personalized services. However, regardless of the level of realism and the application domain, digital personal representations impact users regarding self-perception and social interactions. Furthermore, concerns exist around the potential for the metaverses to exacerbate existing inequalities and enable harmful behaviours. Thus, it is essential to balance the potential benefits with the risks, investigate the facets of the user experience related to virtual personal representations, and the implications this has for users. The research aims at theoretical and experimental investigations of the topic from a design perspective.

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**Keywords** Avatar, human digital twin, metaverse, user experience design, digital identity.

# RESEARCH THEME

XXXIX cycle – a.y. 2023/2024

**Title of the doctoral research**

**Museum Accessibility. Role and responsibility of communication design**

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**Proponent professor**

Dina Riccò

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**Abstract**

Three main factors motivate the importance and urgency of studies in the topic of this research proposal.

1. The recent European Directive 882/2019 on the accessibility requirements of products and services, on the rights of people with disabilities, signals the urgent need to study innovative solutions to obtain accessible design, highlighting also the benefits for all.
2. Last year the ICOM (International Council of Museums) approved a new museum definition, in which it is specified: “Open to the public, accessible and inclusive, museums foster diversity and sustainability” (Prague, August 24th, 2022).
3. The Istat Report on Italian Museums (Dec. 2019), returned these data: 53% of museums are equipped for physical accessibility, useful for people with motor disabilities, and only 12% of museum offer alternative uses to the visual, with tactile paths and information materials for the visually impaired and blind.

In this context, the research proposal is aimed at identifying the roles and responsibilities of communication design in the field of museum accessibility: what are the types of communicative artifacts? What applications of synesthetic translations to content? What digital technologies? What are the methods and processes for designing accessible artifacts in the museum context?

The main expected results include: a review of Italian and international good practices; and the definition of a toolkit for verifying sensory and communicative accessibility in the museum context.

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**Keywords**

Museum Accessibility, Synesthetic translations, Communication design

# RESEARCH THEME

XXXIX cycle – a.y. 2023/2024

**Title of the doctoral research**                      Creating a Lab and an integrated methodological approach to address research, education and consultancy on Design for Sustainability and the circular economy

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**Proponent professor**                              Valentina Rognoli, Alessandro Deserti (co-proponent)

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**Abstract**

The systemic nature of the ecological transition and the urgency of the related challenges require an investment in impact research that accelerates the needed changes. The "systemic design" approach can guide the ecological transition towards systems, products and services that meet circularity and sustainability requirements. Design – understood as systemic and not anthropocentric – can help guide the ecological transition towards the ecosystem's needs.

The project will focus on creating theoretical foundations and practical investigation to build a Lab for research support, education and consultancy in Design for sustainability and the circular economy. Methodologies, tools and processes for constructing circular economy supply chains will be developed and tested, responding to the growing national and international demand. The Lab will seek to experiment new solutions for the use of new materials and components, the extension of the life cycle of the products, the maintenance and servicing, the intersection between services and ecosystem services, the reduction and enhancement of waste (remanufacturing, urban mining), supporting the active participation of users.

The approach will be multidisciplinary, envisaging collaborations with other departments of the Politecnico. The international context will be investigated to study and analyse similar structures. The research methods will combine desk research and RtD. Outcome mapping and reflexive learning will be at the framework's core, offering the opportunity to achieve outcomes and feedback on theorisation to support the development of the new integrated methodological approach.

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**Keywords**    Systemic Design, Design for Sustainability, LCA

# RESEARCH THEME

XXXIX cycle – a.y. 2023/2024

Title of the doctoral research

**Design(ing) Slow Tourism&Small Heritage.**  
**Strategies, paths and models of application in cultural landscapes through phygital approaches**

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Proponent professor

Raffaella Trocchianesi

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## Abstract

The research line aims at creating an **inclusive phygital system** able to support a sustainable management of flows limiting “over tourism” phenomenon thanks to a widespread distribution of attendances through a dynamic redefinition of on demand thematic paths.

The project embraces a hybrid space (on-site/onlife) allowing a multiple kind of experience. It takes into account **time, topic and slow exploration** in order to design new models of cultural experiences. In terms of *time* seasonal cycles and “modularity” of paths are considered as opportunities to create a “tourism itinerary” throughout the year. In terms of *topic* the vocations of the local areas according to the **Slow Tourism** definition are considered, such as food, botany, craft, events connecting landscapes, museums, agritourism, and small production centres. One of the results: an interactive digital mockup (pilot) replicable and adaptable to further contexts.

Traditional historical and naturalist settlement, typical food productions, and craftmanships intertwine with each other and encourage the knowledge of the territory. The development of local chains able to represent Made in Italy brand is opened to a wide audience in order to valorise a work culture focused on knowledge of product and its technological development, as well as to foster new opportunities about young specialised training for the benefit of the territorial economy and local employment.

The project assumes as a case studies 2 contexts with homogeneous features and different peculiarities where experiment new models of phygital experiences. They are chosen coherently with the universities involved:

**Orobia’s Pre-Alpes of Bergamo area (Lombardy)** and the cultural and natural highlands’ ecosystem geographically bounded by the **Sarentino and Isarc valleys (South Tyrol)**.

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Keywords

**Design for Territories, Tourism, Small Heritage**

# RESEARCH THEME

XXXIX cycle – a.y. 2023/2024

**Title of the doctoral research** Service Design to foster just transitions.

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**Proponent professor** Beatrice Villari

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## Abstract

Social inclusion is recognized as a critical goal, process, and outcome that needs to be pursued urgently as part of the 2030 Agenda for Sustainable Development (World Bank, 2013).

Services operate as a social phenomenon and are always embedded within socio-cultural ecosystems (Anderson and Ostrom, 2015) which means that designing service solutions must respond to human diversity by considering multiple identity axes such as gender, sexual orientation, race, and class, as well as intersectionality (Crenshaw, 1989).

To promote the transformation towards justice and inclusion, service systems need to be redesigned, making them inclusive at every level, including individual, community, and state. This can reduce service exclusion and promote social equity (Fisk et al. 2018; Costanza-Chock, 2020).

Service design is increasingly focusing on its transformative role (Sangiorgi 2019) and it is considered as a transformative practice and an intentional pathway to promote the service system transformation (Patrício et al., 2018; Sangiorgi 2011; Vink et al. 2021), integrating systemic and future-oriented perspectives (Lin & Villari, 2021). The transformative practice of service design involves enabling the disruption of fundamental assumptions, beliefs, norms, and the exploration of new service scenarios, making it a powerful tool for promoting social just transformations (Koskela-Huotari et al. 2021).

The research aims to explore how Service Design can be able to support just transitions incorporating principles of equity and sustainability, tolerance, and inclusiveness to define evolutionary paths of the discipline towards an inclusive society. The research has the potential to inform service design education and practice, as well as organizations and institutions who aim to promote just and inclusive services.

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**Keywords** Service Design, Design justice, Systemic approach

# RESEARCH THEME

XXXIX cycle – a.y. 2023/2024

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**Title of the doctoral research**

The image of Other in the age of Algorithms.  
The Role of the New Media for the Acknowledgment of the Cultural Alterity

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**Proponent professor**

Salvatore Zingale

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**Abstract**

The research takes as its starting point the dialectic between Identity and Alterity in the field of communication and media design. It proposes a critique of communication as a hardening of identities and thus as blindness to different social Alterities. In the Era of Algorithms and media that exploit artificial intelligence, with a risky tendency towards homologation, the concern is that only subjectivities that already have a space within the media system will have visibility, overshadowing a semantic and cultural complexity that instead begs to be explored and discovered. How to escape the tendency towards homologation? How to deal with the culture of the post-human and the dialogue with all sorts of Alterity? How to tackle with the “Other” intelligence of AI, which reserves aspects not entirely controllable by human action? In addition to analysing the sociological and anthropological literature on Alterity, the research proposes two stages. The first concerns a critical investigation of forms of iconographic representation of the *Persona*, the *Self* and the *Other* before and after the evolution of digital communication. Where Person as an image to be communicated to others, Self as a construction of identity and Other as an extraneous subjectivity. The second will explore inventive and atypical forms of design, starting with the Infopoetry model elaborated for years in the Density Design Final Synthesis Studio, capable of grasping hidden value aspects of media communication.

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**Keywords**

Alterity, Algorithms, Representation