

# From territory to the expanded museum: interaction design for cultural heritage preservation

Filipe Cruz<sup>(\*)</sup> y Marco Neves<sup>(\*\*)</sup>  
Lisbon School of Architecture,  
University of Lisbon (Portugal)

---

**Abstract:** Cultural heritage faces growing challenges of preservation and transmission in a context of rapid social and technological transformation. Interaction design for territories can act as a mediator in heritage valorization, proposing new ways of understanding the territory as a living exhibition device and by reinterpreting contemporary museographic principles. Based on the study of the parish of Lousa, in the Lisbon Metropolitan Area, Portugal, this work examines how the mapping of spaces, objects, practices, and local narratives can reveal a dense and multifaceted cultural heritage landscape.

The territory is understood here as an expanded museum, where everyday places assume both exhibition and interactive functions. The preservation of cultural heritage, tangible and intangible, extends beyond physical conservation, integrating practices, memories, and experiences that strengthen the bond between communities and their places. Interaction design for territories reinforces this interpretative and participatory dimension by transforming cultural mapping into an active mediation process that not only documents but also reactivates community ties and promotes the symbolic appropriation of heritage. The reflection presented highlights the potential of cultural mapping and interaction design in the interpretative and community-based preservation of heritage, conceiving the territory as an active agent of communication, learning, and cultural recognition, and bringing museography closer to everyday life.

**Keywords:** Interaction design - Interaction design for territories - Cultural heritage - Cultural mapping - Expanded museum - Heritage interpretation - Museography

[Resúmenes en castellano y en portugués en las páginas 189-190]

<sup>(\*)</sup> <sup>(\*\*)</sup> Ver CVs. de Filipe Cruz y Marco Neves en páginas 190-191

---

## 1. Introduction

Contemporary social and technological dynamics, intensified by digitalization and mobility, profoundly transform the way territories preserve and transmit their cultural heritage. This transformation shifts heritage from the domain of conservation to that of experience, reconfiguring the relationship between place, memory, and identity into a field of continuous negotiation between continuity and change (Anico & Peralta, 2009; Baker, 2012). What was once understood as a fixed set of objects and traditions is now recognized as a living system of practices and narratives in constant motion. Mobilities (whether migrations, forced displacements, or daily circulations) activate memory repertoires that both reinforce ties with places of origin and reinvent ways of remembering and assigning meaning to the past (Tošić & Palmberger, 2016).

In urban contexts, this dynamic dimension of memory manifests through sensory and affective experiences. Sounds, smells, and daily routes consolidate emotional bonds with spaces and build what Baker (2012) describes as a sense of interiority associated with place. When the practices that sustain this interiority are interrupted by processes of renewal or gentrification, spatial identity fragments, and places lose part of their symbolic value in community life. Cities thus become palimpsests<sup>1</sup> of overlapping times and experiences, revealing both continuities and erasures (Cheshmehzangi, 2021). This identity fluidity, described by Jones and Garde-Hansen (2012) as “becoming”, demonstrates that belonging is constructed in continuous dialogue with space and the practices that inhabit it.

Based on these dynamics, cultural heritage can be understood as a relational process. Preservation strategies oscillate between the local and the global, often strained by the logic of economic valuation and representations of authenticity (Anico & Peralta, 2009). Globalization tends to homogenize cultural references, but it also stimulates identitarian resistance that converts heritage into a symbolic and community resource. Digitalization and cultural tourism, while opening new avenues of access and mediation, can also reduce heritage to its imagistic and consumer dimension, especially when detached from local practices (Baker, 2012).

In this context, the territory emerges as an expanded museum, where heritage extends beyond traditional institutions. The concept integrates two complementary dimensions. The first stems from technological and virtual expansion, which broadens forms of musealization, accessibility, and public engagement (Hünnekens, 2002). The second manifests in the extension of the museum into the territory, where daily life assumes expository and interpretive functions, challenging the boundaries of contemporary museography. Lerario (2025) designates this approach as the “museum territory”: an area defined by cultural and environmental ties, where heritage structures identities and dynamics of belonging.

This reinterpretation of the territory as a museum opens up space for new forms of cultural mediation, where interaction design arises as a particularly relevant practice. As a practice that articulates people, objects, and contexts, it allows the territory to be approached as a communicative and experiential system. Evolving from its initial conception focused on the digital (Moggridge, 2007), the field expanded into the art of structuring artifacts and human activities in spaces of everyday action (Löwgren & Stolterman, 2004). This evolution integrated the role of physical space and objects in the experience (Hornecker &

Buur, 2006) and recognized the potential of design as a catalyst for the co-creation of cultural meanings (Giaccardi & Fischer, 2008). From a more recent perspective, it is viewed as an expanded field where interactive technologies mediate ecologies of human practices (Giaccardi & Redström, 2020).

Interaction design for territories amplifies this interpretive and participatory dimension, transforming cultural mapping into an active mediation process that identifies, documents, and reactivates tangible and intangible heritage. More than just representing the territory, these practices promote its symbolic appropriation, surpassing physical conservation by integrating practices, memories, and experiences that reinforce the bonds between communities and living spaces (Cruz & Neves, 2024; Stewart, 2007). By articulating materiality, technology, and experience, interaction design transforms the territory into a communicative field in continuous reconfiguration, favoring collaborative practices that articulate past, present, and community (Giaccardi & Fischer, 2008; Manzini, 2015).

## 2. Reconfigurations of museological practice

The classical conception of the museum as a physically delimited institution, focused on the preservation and exhibition of collections, has been reevaluated in light of contemporary social and technological transformations. The concept of the “expanded museum”, analyzed by Hünnekens (2002), reflects on the impact of digital media and virtualization technologies on traditional museological functions. Hünnekens examines how technical reproduction and digitalization allow the museum to transcend its physical barriers, primarily through virtual dissemination and network interconnection, proposing new forms of access and interaction with cultural heritage. The author identifies vectors of this expansion, such as the “expanded exhibit” (the digitally enriched object), “expanded memory” (musealization of the intangible), and “expanded knowledge” (aggregation of digital archives), suggesting a multiplication of musealization beyond standardized institutional formats.

In a complementary way, the notion of the “museum territory”, as proposed by Lerario (2025), centers on the intrinsic relationship between community, territory, and heritage. The author defines it as “an area that is held together by cultural, environmental, historical, and geographical ties, with its resources and heritage elements providing its own distinctive identity” (p. 2). This approach values “territoriality” (understood as a space of cultural and social cohesion) over the building itself. The territory, in this perspective, is not intrinsically a museum but can become one through a participatory process, where the community and other local stakeholders identify and value their heritage resources, aligning with principles that underscore the active role of communities in defining and managing their heritage (Council of Europe, 2005). The perspectives of Hünnekens (2002) and Lerario (2025) can be seen as complementary, technological expansion enhances access to and engagement with the living heritage that resides in community-territory relationships. These concepts dialogue with approaches from the “new museology” (Vergo, 1989) and with models such as the “ecomuseum” (De Varine, 2017; Rivière, 1985) or the “museo

diffuso” (Drugman, 1982), which also advocate for the valuation of heritage in situ, the centrality of the territory, and community involvement. Authors like van Mensch (2021) argue that this paradigm shift moves the focus from the object to the social and cultural processes that give it meaning.

This dual expansion, technological and territorial, challenges traditional museography. The notion of “collection” broadens to include intangible heritage and lived spaces, whose relevance is defined collaboratively (Simon, 2010). “Preservation” evolves from material conservation to prioritize the reactivation and transmission of practices and memories, accepting their intrinsic dynamics and aiming to keep the relationship between the community and its heritage alive (De Varine, 2017).

In this context, everyday spaces with particular symbolic density can function analogously to exhibition spaces, a role often activated by interaction design. Turkle’s (2011) perspective on “evocative objects” helps to understand this potential: common elements, by eliciting personal and collective narratives and memories, transform into interpretive supports for experience. This capacity to evoke and generate meaning allows everyday places and practices to become focal points of cultural interpretation, where the territory reconfigures itself as an expanded museum.

Thus, interaction design can act as a practical extension of museological reflection, not only interpreting the territory but creating the conditions for it to become a shared experience. The relationship between museography and territory thus opens a field of situated experimentation, in which interaction design acts as a mediator between heritage, community, and technology, translating the concept of the expanded museum into living, participatory practice.

### 3. Interaction design for territories as a situated and mediating practice

In expanded museography, the territory is revealed as an interpretive space in continuous reconfiguration. In this framework, interaction design for territories establishes itself as a practice that translates the relationships between people, places, and objects into meaningful experiences, proposing new forms of sensory and social engagement.

The conception of the territory as an expanded museum calls for design practices anchored in lived contexts, where everyday experience, memory, and technology dynamically intertwine. More than creating digital artifacts, this practice mobilizes the symbolic and participatory dimension of the territory, transforming the space into a shared experience (Giaccardi & Fischer, 2008; Hornecker & Buur, 2006).

The situated perspective of design, inspired by Suchman (2006) and Dourish (2004), allows these practices to be understood as processes of contextual mediation. The designer does not act on the territory, but from it, building knowledge in interaction with the community. Each project simultaneously becomes an exercise in reading and cultural translation, where design arises as a form of reflection embedded in action (Schön, 1984).

This interpretive dimension brings design closer to contemporary museography. Just as the curator organizes the narrative of the exhibition space, the designer works on the nar-

rative of the territory, revealing and articulating its multiple meanings (Manzini, 2015; Schön, 1984). Cultural mapping, in this sense, constitutes an expanded museographic gesture, by identifying and representing tangible and intangible heritage, it transforms them into interpretive narratives that reconfigure the perception of the place (Pink, 2015; Tuters & Varnelis, 2006). Mapping ceases to be a collection tool, becoming a process of collective curatorship, where inhabitants and visitors participate in the construction of shared meanings (Lee & Gilmore, 2012).

The mediating function of interaction design also manifests in the creation of devices for dialogue between local and institutional agents. Technological, social, and symbolic mediation acts as a translation tool between distinct perspectives, balancing tensions and promoting mutual understanding (Ehn, 2008). This diplomatic dimension brings design closer to cultural mediation practices oriented toward the co-construction of meanings and the sustainability of relationships (Escobar, 2018; Manzini, 2015), where the process becomes a constitutive part of the outcome. Mobile technologies and participatory networks can extend this mediation, creating interpretive ecosystems that reinforce the museographic and relational vocation of the territory.

The relevance of these approaches becomes clearer when tested in real-world contexts, in which the articulation between heritage, community, and technology requires situated and iterative strategies. The case of the parish of Lousa thus presents itself as a field for design experimentation, where the principles of interaction design for territories materialize in concrete processes of co-creation and cultural mediation. The observation of this context allows for an understanding of how design translates into reflective practice, continuously adjusting its devices to the social and symbolic specificities of the place.

#### 4. Methodological approach

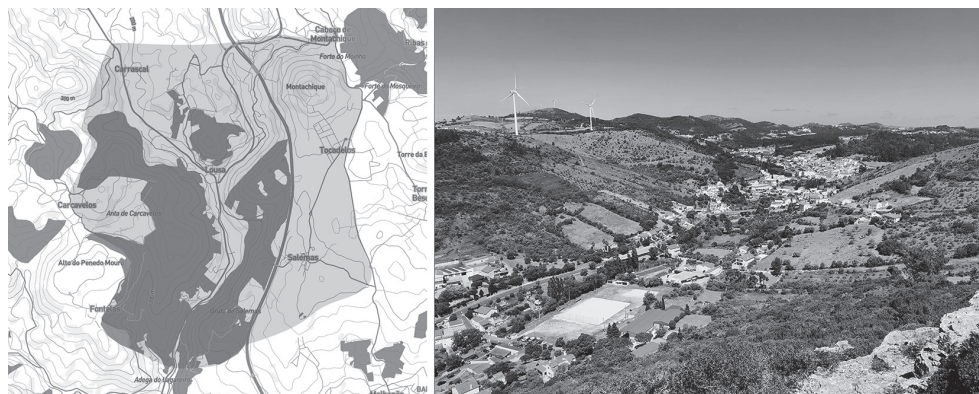
The research followed an interpretive qualitative approach, designed as a case study (Yin, 2018). This methodological choice facilitated an understanding of the parish of Lousa as a complex cultural landscape, observing how heritage values and daily practices intertwine in the making of local identity. The case study method was chosen to provide an in-depth reading of a specific territory, through a situated approach inspired by ethnographic principles (Burgess, 1982).

The research adopted an immersive and iterative stance, grounded in an inductive and flexible logic, where knowledge arose from direct contact with the community and empirical observation. Rather than testing pre-defined hypotheses, the goal was to understand the meanings, relationships, and social dynamics that structure the territory. The interpretive nature involved a continuous dialogue between observation and reflection, acknowledging the influence of the researcher's perspective.

The approach was guided by the practice of interaction design for territories. The method of observation and the questions posed during fieldwork were intentionally directed toward identifying opportunities for intervention: points where design could act as a me-

diator, a facilitator of interpretation, or a catalyst for significant experiences within the territory.

The parish of Lousa (See Figures 1 and 2), located in the municipality of Loures, is part of the Lisbon Metropolitan Area and covers an area of 16.54 km<sup>2</sup>, with 3,216 inhabitants (INE, 2022). Its geographical and morphological position, between valleys and elevations, bordered by the Atalaia, Carregueira, and Servas mountains, results in a transitional landscape between rural and urban. This hybrid condition, reinforced by economic and social diversity, makes Lousa a prime laboratory for observing how heritage and memory articulate with the contemporary challenges of local development. The existence of prehistoric traces, such as the Anta de Carcavelos, vernacular built heritage, and an active network of associations, reveals a territory with high cultural and symbolic density.



Figures 1 and 2. Lousa parish (Mapbox, n.d., retrieved in 2025; Authors, 2025).

The empirical data collection process took place over three months (April to June 2023), through regular visits to Lousa, structured as a continuous process of successive approximations, each visit informed the next, allowing observations to be refined. The objective was to build rapport with the inhabitants to access memories and narratives. Several complementary qualitative techniques were combined, following a detailed cultural mapping protocol:

- Direct observation was the primary technique, allowing for the recording of behaviors, interactions, and uses of space. Visits were conducted at different times and locations (social spaces, cultural facilities, natural areas, festivities) to capture the plurality of situations.

Field notes included detailed descriptions, interpretive reflections, and records of sensory impressions, valuing observation as a situated experience.

- Informal conversations with residents, cultural agents, and institutional representatives replaced formal interviews. Spontaneity favored access to local narratives and perceptions about the territory's transformations, facilitating an understanding of the relationship between memory, identity, and daily practices.
- Audiovisual and photographic documentation (*See Figures 3 and 4*) functioned as an extension of observation, recording the materiality and atmosphere of the places, adding an expressive dimension to the analysis.
- Georeferencing, carried out using GPS technologies and digital platforms, served to locate and spatially cross-reference the identified cultural and natural resources.
- Sociocultural network analysis made it possible to observe the flows of communication and collaboration between associations, entities, and individuals, revealing mechanisms of cultural cohesion.
- Documentary research, supported by historical, geographical, and statistical sources, complemented the field observations, providing chronological and demographic context.

The integration of these techniques produced a rich dataset, supported by the triangulation of visual, narrative, and spatial records to strengthen the research's internal validity.



**Figures 3 and 4.** Collection of audiovisual and photographic material in the parish of Lousa, accompanied by informal interviews with its inhabitants (Authors, 2025).

Data analysis followed the procedures defined in the cultural mapping protocol, focusing on organizing and interpreting the information to reveal Lousa's cultural landscape:

- Classification and cataloging:** The identified cultural resources were classified into six categories (cultural organizations; spaces and facilities; cultural heritage; cultural and creative industries; festivals and events; natural heritage), based on criteria from the Institute

of Museums and Conservation (IMC, 2011) and the Agency for the Development of Creative Industries (Mateus, 2016). Each category included tangible and intangible elements.

**b.** Mapping and visual synthesis: The georeferenced data were converted into interpretive maps. A visual synthesis was also organized, representing cultural and natural resources by articulating different dimensions (natural and cultural heritage, form, and matter).

**c.** SWOT analysis: A SWOT analysis (Strengths, Weaknesses, Opportunities, Threats) was conducted based on the systematized information, focusing on heritage valorization and sustainable tourism development.

The cross-analysis of these levels, informed by the interaction design perspective focused on mediation processes, made it possible to build an integrated view of Lousa's cultural landscape, revealing not only its rich heritage but also the tensions and vulnerabilities affecting its valorization. The adopted methodology thus took shape as a process of discovery and translation, where cultural mapping established itself as both an analytical instrument and a museographic gesture: a way of making "lived heritage" visible. Despite the limitations encountered (interlocutor availability, resource dispersion), these were understood as indicators of the territory's dynamics of transformation.

## 5. Cultural mapping of Lousa

The case study conducted in the parish of Lousa formed the empirical core of the research, allowing for a concrete exploration of the cultural and heritage dynamics within the territory. The analysis of the data collected during fieldwork provides a detailed portrait of Lousa's cultural landscape, revealing how different heritage elements are articulated in the community's daily life and shape the territory as a potential expanded museum. The following interpretation highlights how heritage is lived, practiced, and reinterpreted, reflecting tensions between preservation and change.

The cultural mapping of Lousa identified a diverse set of resources, organized into six main categories (cultural organizations, spaces and facilities, cultural heritage, cultural and creative industries, festivals and events, and natural heritage). This structure revealed the interdependencies between the tangible and intangible dimensions of the territory:

- Cultural organizations: Local associations (sports, recreational, social) function as central mediators of community life. Entities such as the Grupo Desportivo de Lousa (with its historic cycling team), the Grupo Recreativo do Cabeço de Montachique, and the União Recreativa e Social de Salemas operate as hubs of sociability and knowledge transmission, demonstrating the vitality of associational life as a form of cohesion.
- Spaces and facilities: Places for collective gathering and enjoyment, such as the public garden, the Baloioço do Cabeço de Montachique (swing), and the Miradouro do Vale de Lousa (viewpoint), combine recreational functions with landscape value, condensing community life. The Café Central, bearing strong symbolic weight, was confirmed as an intergenerational point of social convergence and local narratives.

- Cultural heritage: A notable temporal stratification was observed, from prehistoric traces (Anta de Carcavelos, Grutas de Salemas) and modern-period architectural and artistic heritage (the Main Church of São Pedro, the Chafariz das Escadinhas fountain) to the agricultural and domestic memory expressed in rural estates. This collection forms a landscape marked by the overlapping of uses and meanings.
- Cultural and creative industries: Although still nascent, local innovation potential was identified, particularly the Escola de Música e Banda Filarmónica da Freguesia de Lousa (Music School and Philharmonic Band), an example of community mobilization. Other initiatives (ateliers, craft activities) configure an emerging cultural economy.
- Festivals and events: A dense and diverse calendar, articulating religious and popular festivals (S. Pedro, S. João, etc.) with recreational and sporting initiatives (the “Rota do Queijo” race, the Cycling Prize), keeps the ritual and collective dimension alive, updating traditions and reinforcing shared identity.
- Natural heritage: Elements such as the Gruta de Salemas, the Fontelas Biodiversity Station, and the centenary Portuguese Oak were identified as reference points in the landscape, holding environmental and pedagogical value. The surrounding mountains and hiking trails complement this picture, reinforcing the territory’s open-air museographic dimension.

The spatial reading resulting from the mapping highlighted the concentration of cultural resources in the central areas and the dispersion of natural resources to the peripheries, indicating a duality between the urban core and the rural margins. This configuration confirms the territory’s transitional character and suggests opportunities for articulating natural and cultural heritage (*See Figure 5*).



**Figure 5.** Visual map of the cultural and natural heritage of the parish of Lousa (Authors, 2025).

Immersion in Lousa's daily life provided an understanding of how heritage manifests in practices and ways of inhabiting. The Café Central, active since the mid-20th century, stood out as a symbol of the continuity and adaptation of local sociabilities, illustrating the resilience of micro-centralities and the importance of meeting places in maintaining collective memory. Recreational and sports associations play a similar role, functioning as spaces for intergenerational sharing and identity anchor points, especially in contexts of population aging. The Philharmonic Band and the Music School exemplify the community's capacity to create endogenous cultural responses.

Strong relationships between tangible and intangible heritage were also observed: festivals, processions, and fairs continue to interact with agricultural landscapes and social spaces, producing sensory and symbolic continuity. The presence of old estates, orchards, and olive presses, associated with harvest rituals, reinforces the perception of the territory as a dynamic cultural ecosystem. Spatially, the coexistence of heritage from different eras (ruins, historic buildings, recent infrastructure) forms a palimpsest where the past remains inscribed in the present. This coexistence translates the notion of an inhabited landscape and brings Lousa closer to the idea of an expanded museum, where everyday experience becomes an interpretive act.

The SWOT analysis synthesized the collected data, cross-referencing cultural, social, and economic dimensions:

- Strengths: Heritage diversity (historical, vernacular, natural), associational vitality, strong sense of community belonging, proximity to Lisbon and Sintra.
- Weaknesses: Scarcity of dedicated cultural and tourism infrastructures, reduced visibility of the parish, fragmentation of initiatives, resource dispersion, and lack of accessible signage/interpretation.
- Opportunities: Development of interpretive routes (articulating natural/cultural), potential for creative, sustainable, and proximity tourism (immersive experiences, community participation), use of emerging technologies for consistent narratives, leveraging regenerative tourism trends.
- Threats: Urban pressure on the rural character, competition from consolidated tourist destinations, scarcity of financial resources for maintenance/promotion, risk of cultural commodification, lack of coordinated strategies.

The intersection of these dimensions reinforces the perception of Lousa as a territory in negotiation, where cultural policies, community practices, and spatial transformations interconnect. The results suggest that interaction design, informed by this analysis, can offer a fertile field for mediation among the different agents, favoring the construction of shared and accessible narratives that respond to the identified challenges.

The results reveal a dense cultural landscape in Lousa, where heritage is distributed across multiple scales of time, space, and meaning. The integrated reading of the mapping confirms that the parish can be interpreted as a museum-territory: a space where objects, places, and practices interconnect in continuous processes of signification. Daily life, festivities, memory, and the environment converge into a living interpretive system. The mapping process revealed that cultural preservation in Lousa seems to depend less on static conservation and more on the continuity of practices and the capacity to produce shared meaning. The analysis confirms that heritage valorization is, above all, a communication process, and that territorial identity is renewed through the interaction between memory, experience, and representation. In this sense, the case of Lousa offers an exemplary view of how cultural mapping can contribute to conceiving and activating the territory as an expanded museum, a space where heritage is lived, told, and continuously reinterpreted.

## 6. Discussion: Interaction Design in the Preservation of Cultural Heritage

The integrated analysis of the Lousa case study results allows for a deeper understanding of how interaction design for territories can operate as an interpretive and mediating device in cultural heritage preservation. The empirical data collected does not merely describe the material and symbolic configuration of the territory; it primarily reveals the complexity of the relationships between people, places, practices, and memories that sustain its cultural vitality. Cultural mapping, as a situated design practice, made visible how

these elements intertwine in a dynamic communicative system. Discussing these findings, articulated with the theoretical framework, allows for a deeper reading of the territory as an expanded museum and of design as an active mediator between heritage, community, and transformation.

### ***a. The Territory as an Expanded Museum: From Description to Interpretation***

The results show that Lousa constitutes a cultural ecosystem that is continuously evolving, rather than a static set of heritage elements. This condition empirically validates the notion of the museum-territory (Lerario, 2025), in which heritage, natural, and social resources structure identities and bonds of belonging. The observed practices (community festivals, associational sociabilities, daily routes) function as “living exhibitions” of a collective memory that is continuously renewed through shared experience.

In this perspective, museography transcends the museum institution to become a broader interpretive ecology, where the territory itself functions as an exhibition medium. The observations in Lousa demonstrate that preservation is achieved not only through the physical conservation of objects or buildings but, fundamentally, through the continuity of the practices that give them meaning and symbolically activate them. Heritage, when experienced in daily life, acquires a performative value, it remains alive while it is practiced, narrated, and appropriated by the community. This understanding converges with Hünnekens’s (2002) vision of the “expanded museum”, which describes the diffusion of the museological function beyond institutional walls, and dialogues with the principles of the new museology (Vergo, 1989), which shift the focus from the collection to the social processes of signification.

The coexistence of prehistoric ruins, rural estates, and contemporary social spaces in Lousa illustrates a temporal continuity that challenges traditional hierarchies. The observed cultural landscape behaves like a palimpsest (Cheshmehzangi, 2021), where the past is not just a trace but a layer in dialogue with the present. Cultural mapping, by identifying and representing these overlaps, functioned as a tool for interpretation, allowing different temporalities to coexist in an interpretive narrative. Thus, the territory reveals itself as an expanded museum not by external conceptual imposition, but by observing its own intrinsic dynamics of meaning production.

### ***b. Interaction Design as Cultural Mediation***

The case analysis confirms the potential of interaction design to function as a mediator between the material, symbolic, and social dimensions of the territory. The research and mapping process in Lousa itself acted as a mediating device, translating multiple perspectives, those of the inhabitants, local institutions, and the researcher, into a shared interpretive system. As Ehn (2008) and Escobar (2018) maintain, design can establish processes of cultural negotiation, where knowledge arises from situated collaboration.

In Lousa, this mediation operated at different levels. On the symbolic level, it gave visibility to and articulated practices and memories that would be difficult to fit into conventional museological categories. On the social level, it manifested in building trust and mutual recognition between the community and the researcher, essential for accessing deeper narratives. On the communicative level, it involved translating observations into interpretive artifacts (maps, photographic records, syntheses) that potentially reflect to the community an organized image of itself. This reciprocal process reflects the diplomatic role of design, understood as a practice of translation between distinct voices, times, and values. The situated and iterative nature of the fieldwork allowed design to act less as a neutral representation technique and more as an active listening practice. Each visit reconfigured the understanding of the territory, highlighting that cultural mediation is a process of continuous learning. Schön's (1984) perspective on "reflection-in-action" finds a direct translation here, the designer-researcher acts, observes, and reformulates simultaneously, producing knowledge in interaction with the context. This dynamic brings design closer to interpretive ethnography, while adding a design-oriented focus, that of identifying opportunities to design meaning-making devices based on the observations.

### ***c. Cultural Mapping as a Communicative Practice and Museographic Gesture***

This mediating capacity of design materialized, in the Lousa case, particularly clearly through the practice of cultural mapping, which here functioned not only as a collection method but as an expanded museographic act. Its function surpassed objective recording, establishing itself as a device of symbolic mediation. By organizing the collected information into categories and, above all, into integrated visualizations, the mapping constructed a coherent narrative about Lousa's cultural landscape, linking elements that might have seemed dispersed.

The interpretation of the data suggests that mapping can be understood as a design language: it translates territorial complexities into legible structures, making the invisible or implicit more accessible. This communicative dimension is essential in contemporary heritage preservation, where the challenge increasingly lies in keeping the connections between people and places alive. Mapping acted as a means of reactivating the territory's participatory ecology (Giaccardi & Fischer, 2008), articulating memories and practices around a representation that can be shared.

The participatory nature of the process, even if informal in the conversations that were held, highlighted the importance of community collaboration in building heritage knowledge. The involvement (albeit sporadic) of local associations and the interest shown by some residents showed that mapping is also an act of social recognition. By seeing their daily lives and memories reflected in a structured representation, inhabitants can reinterpret their own territory, reaffirming their sense of belonging. It is this potential feedback loop that can transform interaction design into a lasting mediator. The knowledge generated does not end with the analysis but can return to the community in the form of an interpretive mirror, a basis for future actions.

#### ***d. Tensions between Preservation, Transformation, and Sustainability***

A critical reading of the results highlights a set of tensions inherent to the contemporary condition of cultural territories like Louisa:

- **Preservation vs. Transformation.** Urban pressure and proximity to the metropolis create forces for change that can threaten the territory's symbolic and physical integrity, but which simultaneously open opportunities for renewal. Interaction design can intervene in this intermediate space, not to stop change, but to promote a critical reading of the transformations and stimulate valorization strategies based on cultural continuity, dialoguing with the new dynamics.
- **Materiality vs. Intangibility.** The mapping highlighted that Louisa's vitality resides significantly in its intangible practices (sociabilities, festivals, routes). However, these often lack institutional recognition and adequate documentation devices. Design can act as a mediator between the ephemeral and the permanent, exploring forms of recording and sharing (digital or otherwise) that respect the living nature of these expressions, giving them visibility and transmissibility.
- **Local vs. Global (Tourism).** Tourism, when guided only by market logic, risks homogenizing experiences and turning heritage into a consumer product. However, when conceived in a participatory and interpretive way, it can reinforce local identity and generate sustainable development. In Louisa, the potential for creative and proximity tourism (identified in the SWOT analysis) suggests this path of balance. Interaction design can structure immersive experiences that promote a genuine encounter between visitors and the community, transforming the act of visiting into a process of reciprocal learning.

These tensions confirm that heritage preservation is a process of continuous negotiation, not a final state. Interaction design, by recognizing and addressing this instability, offers conceptual and practical tools to mediate interests, translate values, and devise collaborative strategies for the future.

#### ***e. Theoretical Contributions and Practical Implications***

The analysis developed highlights three main contributions. First, it underscores the relevance of understanding interaction design for territories as an interpretive and situated practice, rather than a purely technological discipline. The Louisa study demonstrated that design can operate as applied hermeneutics: a way of reading and making the cultural complexity of a place legible.

Second, it confirms the relevance of cultural mapping as a complex mediation device, integrating analytical, museographic, and social dimensions. The process not only systematized information but also built a shared narrative that can restore meaning to the territory, suggesting its potential as a tool for participatory planning and heritage communication. Finally, the study contributes to consolidating the concept of the museum-territory as an interactive ecosystem, where design practices serve as an interface between heritage and

its communities. Lousa exemplifies how contemporary preservation depends on the symbolic and communicative activation of heritage.

On a practical level, these contributions open possibilities for creating interpretive routes, digital mediation devices, and sustainable tourism strategies based on community participation in Lousa and similar contexts. Such applications would extend the museographic gesture of mapping, transforming it into an interactive and educational experience, where design acts as an infrastructure that can sustain the continuity of memory and the reinvention of the territory.

## Conclusion and future implications

The research conducted made it possible to understand interaction design for territories as a practice of mediation and cultural preservation, capable of translating the complexity of the relationships between community, memory, and space. The Lousa case demonstrated that heritage is not limited to a set of material assets but constitutes a living network of practices and meanings in continuous transformation. By recognizing this dynamic dimension, the study confirmed that preserving implies communicating, interpreting, and reactivating. These are the actions in which interaction design finds its operative field.

The theoretical path traced showed that transposing museological logic onto the territory requires a procedural and participatory perspective. Instead of fixing heritage in a static record, design contributes to its maintenance by creating devices that sustain the circulation of meanings. In Lousa, cultural mapping materialized this idea by converting observations, narratives, and memories into shared representations, allowing the community to recognize itself through the stories and images of its own territory. The process evolved into an interpretive practice, but also into a political and symbolic act, giving the community back the voice to narrate its heritage in the first person.

The critical interpretation of the results thus reinforces the relevance of interaction design as a cultural mediator. Its value lies not only in the ability to design artifacts, but in creating the conditions for heritage relationships to remain active. By promoting dialogue between local agents, researchers, and institutions, design translates knowledge and expectations that rarely converge spontaneously. This mediating function proves essential in hybrid contexts like Lousa, where rurality and urbanity interpenetrate and where cultural sustainability depends on the articulation between different scales of belonging.

The territory, understood as an expanded museum, thus appears as a collective learning space. Everyday places, community practices, and natural landscapes become exhibition media for a shared narrative. Interaction design, by operating on these narratives, transforms observation into interpretation, and interpretation into cultural action. This circular logic of observing, interpreting, and acting sustains a preservation approach that is simultaneously communicative and transformative. Preservation ceases to be an act of conservation and becomes a process of co-creating meaning, where cultural continuity depends on participation and the constant updating of practices.

From a theoretical standpoint, the study helps consolidate the notion of interaction design for territories as applied hermeneutics. Its relevance is not limited to the technological or aesthetic domain, but is inscribed in the sphere of interpretive knowledge, design acts as a method for reading the territory and, simultaneously, as a language for rewriting it. This perspective expands the traditional boundaries of design, bringing it closer to the humanities and social sciences, and reinforces its capacity to intervene in contemporary cultural mediation.

On a methodological level, the research validates the potential of cultural mapping as both an analytical and a mediating instrument. Its effectiveness was demonstrated not only in systematizing complex information about the territory but also in building coherent narratives that can inform local cultural policies, territorial planning, and sustainable tourism strategies. Mapping, understood and applied as an expanded museographic gesture, establishes itself as a robust process of analysis and mediation, especially when articulated with interactive technologies that enhance accessibility and participation.

These practical perspectives point toward a redefinition of design's role in the territorial context: less as an executor of solutions and more as a facilitator of co-interpretation processes. The Lousa case highlights that the future of heritage preservation may depend on the ability to develop open methodologies that embrace a diversity of voices and recognize the territory as a space in permanent negotiation.

For future research, consolidating this approach requires a twofold deepening. On one hand, it will be relevant to expand the study to other territories with distinct characteristics (rural, urban, or coastal) to evaluate the transferability of the principles outlined here. On the other hand, it is important to explore the potential of interactive technologies and data visualization in building heritage mediation ecosystems. The intersection of digital cartography, augmented reality, and participatory design could broaden the accessibility and experiential dimension of cultural valorization projects.

More than concluding, this research opens paths. By demonstrating that interaction design can articulate knowledge, experience, and community, it reaffirms that cultural heritage is preserved not just by memory, but by the continuity of the relationships that sustain it. Lousa revealed that these relationships are simultaneously fragile and resilient, and that design, by acting as a sensitive and reflective mediator, can strengthen their rootedness and project new horizons of belonging.

In this broadened perspective, the territory ceases to be a mere backdrop and becomes an agent of communication and learning. The expanded museum is not just a metaphor, but a living practice, a space where the past dialogues with the present through shared experience. Interaction design, by transforming mapping into a museographic gesture, returns its narrative power to the territory. Preserving, in this context, means activating memories, bonds, and ways of inhabiting that keep culture in motion.

## Notes

1. Cheshmehzangi (2021) applies the palimpsest metaphor to urban space to show how cities accumulate layers of time, use, and meaning. Similar to a manuscript rewritten multiple times, traces of the past remain beneath new inscriptions, creating a landscape of superimpositions where urban memories coexist with contemporary transformations. This concept is useful for understanding how planning and regeneration processes can both preserve and erase identity references, depending on how the different layers of memory are recognized and reinterpreted.

## Bibliographic references

- Anico, M., & Peralta, E. (2009). *Heritage and Identity: Engagement and Demission in the Contemporary World*. Routledge.
- Baker, K. (2012). Identity, Memory and Place. *The Word Hoard*, 1(1), 23–34.
- Burgess, R. G. (1982). *Field Research: A Sourcebook and Field Manual*. Routledge.
- Cheshmehzangi, A. (2021). *Urban Memory in City Transitions: The Significance of Place in Mind*. Springer.
- Council of Europe. (2005). *Framework Convention on the Value of Cultural Heritage for Society* (199; Council of Europe Treaty Series, p. 9). <https://rm.coe.int/1680083746>
- Cruz, F., & Neves, M. (2024). Interaction Design for Territories: Fostering Community-Centered Design Experiences in Peri-Urban Contexts. *Design, User Experience, and Usability: 13th International Conference, DUXU 2024, Held as Part of the 26th HCI International Conference, HCII 2024, Washington, DC, USA, June 29–July 4, 2024, Proceedings, Part I*, 3–21. [https://doi.org/10.1007/978-3-031-61351-7\\_1](https://doi.org/10.1007/978-3-031-61351-7_1)
- De Varine, H. (2017). *L'écomusée singulier et pluriel. Un témoignage sur cinquante ans de muséologie communautaire dans le monde*. L'Harmattan.
- Dourish, P. (2004). *Where the Action Is: The Foundations of Embodied Interaction*. The MIT Press. <https://doi.org/10.7551/mitpress/7221.001.0001>
- Drugman, F. (1982). Il Museo Diffuso. *Hinterland*, 21/22, 24–25.
- Ehn, P. (2008). Participation in Design Things. *Proceedings of the Tenth Anniversary Conference on Participatory Design 2008*, 92–101.
- Escobar, A. (2018). *Designs for the Pluriverse: Radical Interdependence, Autonomy, and the Making of Worlds*. Duke University Press.
- Giaccardi, E., & Fischer, G. (2008). Creativity and Evolution: A Metadesign Perspective. *Digital Creativity*, 19(1), 19–32. <https://doi.org/10.1080/14626260701847456>
- Giaccardi, E., & Redström, J. (2020). Technology and More-Than-Human Design. *Design Issues*, 36(4), 33–44. [https://doi.org/10.1162/desi\\_a\\_00612](https://doi.org/10.1162/desi_a_00612)
- Hornecker, E., & Buur, J. (2006). Getting a Grip on Tangible Interaction: A Framework on Physical Space and Social Interaction. *Proceedings of the SIGCHI Conference on Human Factors in Computing Systems*, 437–446. <https://doi.org/10.1145/1124772.1124838>

- Hünnekens, A. (2002). *Expanded Museum: Kulturelle Erinnerung und virtuelle Realitäten*. Transcript Verlag.
- IMC. (2011). *Kit de Recolha de Património Imaterial*. MatrizPCI. <http://www.matrizpci.dgpc.pt/MatrizPCI.Web/AreaJovens/Kit>
- INE. (2022). *Objetivos de Desenvolvimento Sustentável – Agenda 2030. Indicadores para Portugal: 2015-2021*. Instituto Nacional de Estatística. <https://www.ine.pt/xurl/pub/31592402>
- Jones, O., & Garde-Hansen, J. (2012). *Geography and Memory: Explorations in Identity, Place and Becoming*. Palgrave Macmillan.
- Lee, D., & Gilmore, A. (2012). Mapping Cultural Assets and Evaluating Significance: Theory, Methodology and Practice. *Cultural Trends*, 21(1), 3–28. <https://doi.org/10.1080/09548963.2012.641757>
- Lerario, A. (2025). Museums and Territories: An Exploration of New Scopes for Mapping Technologies. *Heritage*, 8(5). <https://doi.org/10.3390/heritage8050179>
- Löwgren, J., & Stolterman, E. (2004). *Thoughtful Interaction Design: A Design Perspective on Information Technology*. The MIT Press.
- Manzini, E. (2015). *Design, When Everybody Designs: An Introduction to Design for Social Innovation*. The MIT Press.
- Mapbox. (n.d.). Mapbox [Digital mapping platform]. <https://www.mapbox.com>
- Mateus, A. & A. (2016). *A Economia Criativa em Portugal. Relevância para a Competitividade e Internacionalização da Economia Portuguesa*. ADDICT - Agência para o Desenvolvimento das Indústrias Criativas. <https://www.fjuventude.pt/files/files/catalog/Estudo-ADDICT-Economia-Criativa-20200925-105712.pdf>
- Moggridge, B. (2007). *Designing Interactions*. MIT Press.
- Pink, S. (2015). *Doing Sensory Ethnography* (2.<sup>a</sup> ed.). SAGE Publications.
- Rivière, G. H. (1985). The Ecomuseum – An Evolutive Definition. *Museum International*, 37(4), 182–183. <https://doi.org/10.1111/j.1468-0033.1985.tb00581.x>
- Schön, D. A. (1984). *The Reflective Practitioner: How Professionals Think In Action*. Basic Books.
- Simon, N. (2010). *The Participatory Museum*. Museum 2.0.
- Stewart, S. (2007). *The Creative City Network of Canada's Cultural Mapping Toolkit*. Creative City Network of Canada. [https://www.creativecity.ca/wp-content/uploads/2020/12/cultural\\_planning\\_toolkit.pdf](https://www.creativecity.ca/wp-content/uploads/2020/12/cultural_planning_toolkit.pdf)
- Suchman, L. (2006). *Human-Machine Reconfigurations: Plans and Situated Actions* (2.<sup>a</sup> ed.). Cambridge University Press; Cambridge Core. <https://doi.org/10.1017/CBO9780511808418>
- Tošić, J., & Palmberger, M. (2016). *Memories on the Move: Experiencing Mobility, Rethinking the Past*. Palgrave Macmillan.
- Turkle, S. (2011). *Evocative Objects: Things We Think With*. The MIT Press.
- Tuters, M., & Varnelis, K. (2006). Beyond Locative Media: Giving Shape to the Internet of Things. *Leonardo*, 39(4), 357–363. <https://doi.org/10.1162/leon.2006.39.4.357>
- van Mensch, P. (2021). Looking for a Rationale Behind Museum Practice: Building Bridges at the Reinwardt Academie. Em D. Tzortzaki & S. Keramidas (Eds.), *Theory of Museology. Main Schools of Thought 1960-2000* (Vol. 13, pp. 121–138). The Norwegian Institute at Athens.

Vergo, P. (1989). *The New Museology*. Reaktion Books.

Yin, R. K. (2018). *Case Study Research and Applications: Design and Methods* (6.ª ed.). SAGE.

---

**Resumen:** El patrimonio cultural enfrenta crecientes desafíos de preservación y transmisión en un contexto de rápida transformación social y tecnológica. El diseño de interacción para territorios puede actuar como mediador en la valorización del patrimonio, proponiendo nuevas formas de comprender el territorio como un dispositivo expositivo vivo y reinterpretando principios museográficos contemporáneos. Basado en el estudio de la parroquia de Lousa, en el Área Metropolitana de Lisboa, Portugal, este trabajo examina cómo el mapeo de espacios, objetos, prácticas y narrativas locales puede revelar un paisaje patrimonial cultural denso y multifacético.

El territorio se entiende aquí como un museo expandido, donde los lugares cotidianos asumen simultáneamente funciones expositivas e interactivas. La preservación del patrimonio cultural, tanto tangible como intangible, se extiende más allá de la conservación física, integrando prácticas, memorias y experiencias que fortalecen el vínculo entre las comunidades y sus lugares. El diseño de interacción para territorios refuerza esta dimensión interpretativa y participativa al transformar el mapeo cultural en un proceso activo de mediación que no solo documenta, sino que también reactiva los vínculos comunitarios y promueve la apropiación simbólica del patrimonio.

La reflexión presentada destaca el potencial del mapeo cultural y del diseño de interacción en la preservación interpretativa y comunitaria del patrimonio, concibiendo el territorio como un agente activo de comunicación, aprendizaje y reconocimiento cultural, y acercando la museografía a la vida cotidiana.

**Palabras clave:** Diseño de interacción - Diseño de interacción para territorios - Patrimonio cultural - Mapeo cultural - Museo expandido - Interpretación del patrimonio - Museografía

**Resumo:** O património cultural enfrenta crescentes desafios de preservação e transmissão em um contexto de rápida transformação social e tecnológica. O design de interação para territórios pode atuar como mediador na valorização do património, propondo novas formas de compreender o território como um dispositivo expositivo vivo e reinterpretando princípios museográficos contemporâneos. Com base no estudo da freguesia de Lousa, na Área Metropolitana de Lisboa, Portugal, este trabalho examina como o mapeamento de espaços, objetos, práticas e narrativas locais pode revelar uma paisagem patrimonial cultural densa e multifacetada.

O território é compreendido aqui como um museu expandido, no qual os lugares cotidianos assumem simultaneamente funções expositivas e interativas. A preservação do património cultural, tanto tangível quanto intangível, estende-se para além da conservação física, integrando práticas, memórias e experiências que fortalecem o vínculo entre as comunidades e seus lugares. O design de interação para territórios reforça essa dimensão

interpretativa e participativa ao transformar o mapeamento cultural em um processo ativo de mediação que não apenas documenta, mas também reativa vínculos comunitários e promove a apropriação simbólica do patrimônio.

A reflexão apresentada evidencia o potencial do mapeamento cultural e do design de interação na preservação interpretativa e comunitária do patrimônio, concebendo o território como um agente ativo de comunicação, aprendizagem e reconhecimento cultural, e aproximando a museografia da vida cotidiana.

**Palavras-chave:** Design de interação - Design de interação para territórios - Patrimônio cultural - Mapeamento cultural - Museu expandido - Interpretação do patrimônio - Museografia

---

(<sup>\*)</sup> **Filipe Cruz** is a PhD candidate at the Lisbon School of Architecture, University of Lisbon, conducting research in interaction design for territories. Since 2020, he has collaborated with the CIAUD research centre, developing a conceptual model that explores how design can foster local community engagement and enhance the value of territories, while offering a framework for future research and initiatives at the intersection of design, territory, and community.

Holding a degree in graphic design from ESAD.CR, he worked for nearly two decades as an editorial designer and art director, leading visual identities and editorial projects. He currently teaches interface design and digital publications at ISEC Lisboa and multimedia at the Cidadela High School in Cascais.

His academic output includes book chapters and contributions to international conferences, such as HCI International, covering community-centered design, interaction in peri-urban contexts, and research methods in design. His experience integrates professional practice, teaching, and research, with a focus on fostering participatory and interactive practices that strengthen the connection between communities and local heritage. [filipedacruz@gmail.com](mailto:filipedacruz@gmail.com)

(<sup>\*\*</sup>) **Marco Neves**, Associate Professor at the Lisbon School of Architecture, University of Lisbon (FA-ULisboa), where he lectures in master's and doctoral degrees. Coordinator of the Interaction Design Master's degree and Coordinator of <div>, Design, Interaction, and Visualization research group. He is Vice-President of the Scientific Council and was also Head of the Design Department at FA-ULisboa (2019-2020). Marco holds a Habilitation (Agregação) in Design, a PhD in Design from FA-ULisboa, and a Communication Design degree from the Faculty of Fine Arts, University of Lisbon. His research focuses on design research methods, design for interactions, experiences with print and digital media, interaction transitions to static media through technological augmentation, and understanding of tangible interfaces. He also works on several intersections between interaction design, social challenges, educational settings, and information visualisation. He is the author of several scientific papers and book chapters in his research areas and advisor of several PhD and master's degrees research. Member of scientific commissions of international

conferences in the design field. Integrated researcher at the Center for Research in Architecture, Urbanism and Design (CIAUD) of FA-Ulissboa, and collaborating member of the Interactive Technologies Institute (ITI-LARSyS). [mneves@fa.ulissboa.pt](mailto:mneves@fa.ulissboa.pt)