

Riding the Hippogriff: a VR Exploration of Orlando Furioso Epic Poem.

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Abstract

This paper explores the potential of Virtual Reality (VR) in cultural heritage experiences through an interactive reimagining of the journey to the moon in Ludovico Ariosto's Orlando Furioso poem. Developed as part of the "Furiose Interazioni" project, officially presented in September 2023, this VR installation, the third of a path structured through a "station-based" methodology, aims to bridge historical literature and digital storytelling, engaging users of different ages in a first-person shareable, immersive experience. Starting from the analysis of the state of the art in Virtual Reality for enhancing tangible and intangible cultural heritage, the study discusses the theoretical, technological, and interaction design choices behind the project, addressing challenges such as maintaining narrative authenticity, adapting literary content for interactive media, and ensuring accessibility across diverse audiences. User evaluation results, during the first year of opening, demonstrate how VR enhances engagement, learning, and emotional connection, highlighting the broader implications of immersive technologies in digital heritage.

CCS Concepts

- **Human-centered computing** → Interaction design process and methods; Empirical studies in interaction design; • **Applied computing**
→ Arts and Humanities.
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1. Introduction

Virtual Reality (VR) has emerged as a transformative technology in cultural heritage, enabling a shift from passive observation to active, multisensory engagement. This paper contributes to this growing field of research by presenting a case study of a VR application developed as part of the Furiose Interazioni project, launched in September 2023 at the Mauriziano Palace in Reggio Emilia, Italy. The project represents a pioneering effort to create digital narratives that honour literary tradition while leveraging contemporary immersive technologies. Specifically, this work explores the third station of the Furiose Interazioni path, i.e. a VR installation based on Ludovico Ariosto's Orlando Furioso, allowing users to embody the character Astolfo in his quest to

retrieve Orlando's lost sanity from the moon. Unlike conventional VR heritage applications that emphasize the reconstruction of physical spaces or tangible artifacts, this installation materializes an imaginary literary world, highlighting the interpretive challenges and conceptual demands of translating metaphorical content into virtual environments. The paper addresses three key research questions in digital humanities and immersive heritage design: (1) How can VR effectively render the metaphorical and imaginative dimensions of classical literature while preserving narrative authenticity? (2) What interaction strategies best support user engagement with complex literary narratives across diverse audiences? (3) How does the interplay of physical and digital elements enhance emotional resonance and narrative comprehension? By exploring these questions, the study examines design methodologies,

implementation challenges, and user feedback from the installation's first year. The findings suggest that well-crafted VR experiences can foster deep emotional engagement and new forms of cultural transmission, aligning classical literary interpretation with contemporary digital practice.

2. Background and Related Work

Virtual Reality (VR), along with its related forms, Augmented Reality (AR) and Mixed Reality (MR), has rapidly evolved over recent decades, becoming an increasingly influential tool across various disciplines, including the Digital Humanities. Traditionally, VR in this context has been used to recreate and provide access to physical places or objects that are no longer accessible, such as archaeological sites or museum collections. However, the concept of "place" in VR is no longer limited to the physical realm. Recent developments are exploring how immersive technologies can also offer access to imagined or symbolic spaces – those found in literature, mythology, or artistic narratives. This shift opens new pathways for engaging with intangible heritage, particularly in the form of narrative or literary content. Thus, it is possible to categorize VR applications in cultural heritage into two main approaches: reconstruction of tangible heritage sites or artifacts and representation of intangible cultural narratives. While most existing work focuses on the former, the presented project contributes to the emerging field of the latter. Indeed, VR is here used to engage not only with tangible heritage but also with intangible cultural worlds – specifically, that of the *Orlando Furioso* by Ludovico Ariosto.

2.1. Remediation and literature in VR

The enduring relevance of Ariosto's sixteenth-century epic poem, as noted by Genovese [Gen17], lies in its remarkable capacity for continual reinterpretation through changing forms and media. This process, known as remediation [Bol17], describes how literature is reconfigured across different historical and technological contexts, transforming into new artistic forms such as visual art, music, or performance. These media do not simply transmit stories but actively reinterpret them, enabling literature to remain relevant and adaptable over time.

In the contemporary era, digital technologies serve as the latest instruments of remediation, introducing new ways for literature to be experienced and understood. Among these, digital narratives, a form of storytelling defined by interactivity, non-linearity, and multimedia integration, mark a significant evolution in how audiences engage with narrative content [Kau24]. Digital narratives empower users to embrace non-

linearity and interactivity while challenging authors (as per Bolzoni's broader definition, extending authorship to include digital curators, designers, and developers) with new tools for artistic expression

Technologies such as virtual reality (VR) further enhance this experience, offering deeply immersive, three-dimensional, interactive storytelling environments. As digital heritage projects increasingly incorporate virtual reality for digital narrative, it is important to reflect on the impacts on the user as well as on the authors, to elaborate effective strategies to transmit literary knowledge.

2.2 State of the art of cultural heritage and literary projects using VR

In discussing a VR application about literary work, this paper positions itself within a growing area of research that presents both exciting possibilities and unique challenges. Despite this emerging interest, VR projects dedicated specifically to literary heritage remain scarce. However, selected projects from adjacent domains provide valuable insights into narrative structuring, user interaction design, and emotional engagement.

One of the most distinctive characteristics of Virtual Reality (VR) applications is their strong association with three-dimensional features, such as 3D objects and spatial environments. Many existing VR initiatives focus on tangible cultural heritage, particularly in the fields of archaeology and museology. A pioneering area in the application of VR to cultural heritage has indeed been the field of "Virtual Archaeology" (VA), a term introduced in 1990 to describe the use of computer-based simulations of archaeological excavations. One of the most notable VA projects is about Forum of Augustus in Rome, which digitally reconstructs the ancient site and overlays the simulation onto its current physical location. [FFP*20].

Due to their ability to provide access to otherwise unreachable places, VR-based projects are widespread within the sector – either if they reconstruct historical sites or inaccessible areas for other reasons. A remarkable example of the second category is the *Branccacci POV* project [CNR25], which offers immersive access to the Brancacci Chapel in Florence through a VR experience realized while the site was undergoing restoration. By leveraging high-resolution 3D scans captured from the vantage point of restoration experts, the project enables users to explore hidden visual and narrative details of the frescoes usually inaccessible by the public [PBB*23]. Crucially, the experience supports multi-user interaction, allowing up to five participants to navigate the space collaboratively and share insights in real time, facilitated by the open-source ATON framework [PCD*23]. It also emphasizes accessibility, offering remote

participation via a web platform. Although focused on tangible heritage, *Brancacci POV* exemplifies key design strategies – particularly collaborative exploration and inclusive access – that have been shown critical in representing intangible literary worlds in VR.

Virtual tours are another key application of the VR inclusive potential in the cultural sector, such as the one developed for the Dante House Museum in Florence [MCD25]. To make the newly renovated museum accessible to all visitors, a dedicated VR app has been designed to allow users to "walk" through its rooms and explore the multimedia exhibits. Presence in dedicated spaces is no longer required, as users can immerse themselves in the environment from anywhere through their own devices. Moreover, the technology used by ETT to create virtual tour enables interaction between the 3D digital space and the user through intuitive hotspot activation so that users can explore the real museum space and experience the visit as if they were physically present.

Beyond reconstructing real-world environments, virtual reality (VR) is increasingly being applied to intangible cultural narratives and imagined spaces rooted in literature, mythology, and artistic expression. These non-physical yet culturally meaningful environments expand the concept of "place" in VR, offering new possibilities for immersive engagement within the digital humanities. While industries like video games and cinema have long used technologies such as 3D modeling and CGI to depict fictional worlds, recent advancements have significantly improved realism and efficiency. These tools are now being adopted in museum installations and digital humanities projects, where they serve not only aesthetic purposes but also educational and interpretive goals.

In the broader vision related to literature heritage, a notable example bridging VR reconstructions of real-world locations and fictional environments is the *Faust VR* project [AEF25]. Developed for the 150th anniversary of director Max Reinhardt, the Salzburg Festival's *FAUST 2023 – A Performative Tour* revived his legendary production of Goethe's *Faust* (1933–1937) through an immersive VR experience. Set in the original venue, the Felsenreitschule in Salzburg, the experience combines narrated history, archival materials, music, and 3D virtual stage elements to reconstruct a symbolic "city of Faust." By merging physical and virtual spaces, it delivers a multilayered sensory journey that redefines the boundaries between real and imagined space in contemporary theater, but it's not strictly related to the theatrical play.

In the field of literature, finally, an important example is that of

the VR Escape Room Alice (2021), produced by ARVI Lab17, [ARV25], where participants are engaged in solving puzzles and challenges to move through the fantastical environments of Carroll's story. Users navigate virtual space through teleportation using VR controllers, while spatialized audio enhances immersion by varying voice distance based on avatar positions. The VR Escape Room Alice (2021) [ARV25] provides a relevant comparison point for the use case presented in this paper. While both projects adapt literary classics to VR, they differ significantly in their approaches: Alice focuses on puzzle-solving gameplay with complex mechanics suitable for experienced VR users (60-75 minutes, 1-6 players), prioritizing entertainment over educational value. In contrast, *Furiose Interazioni* station emphasizes educational and interdisciplinary approaches, incorporating rigorous philological design and offering differentiated experiences for various age groups through both VR headsets and physical interactive installations. This comparison highlights how distinctive design philosophies shape the adaptation of literary content for immersive media. This kind of experience has been addressed by Fabrizia Bandi [Bandi23] as a deeper analysis beyond the intuitive impression of presence, exploring how virtual space is gradually and in a multilayered way constructed through user experience. The concept of *cyberspace*, understood as a multidimensional, computer-generated environment, has become central to her reflection, describing how VR moves beyond metaphor to offer a truly inhabitable space, where users experience not just images but *an-icons*, environmental images that create a genuine sense of spatial presence. From a phenomenological perspective, VR constitutes a real form of spatiality, prompting us to consider not only how it changes our understanding of "where," but also how it repositions users within or alongside physical space. Unlike other digital environments that induce *detritorialization*, VR also produces *reterritorialization*, relocating the user into a new, embodied "here" through immersive interaction and a continuous feedback loop between perception and action. Finally, Bandi claims that this spatial construction is linked to a method shared with literature: the suspension of judgment. By setting aside assumptions about the physical world and its objects, users can focus purely on the structure of their perceptual experience. This concept underpins *Furiose Interazioni* as well, in the founding idea that contemporary technologies not simply offer new ways to access literary texts, but reactivate the deeper mechanisms already embedded in literature.

Remediation of literature through VR raises challenges of adapting a literary text original narrative richness while dealing with the inherent technological and designing complexity. In

these types of projects, the goal of fidelity in virtual reproduction does not lie in accurately reconstructing a real-world location, but rather in remaining true to the authenticity of the transmitted message. Literary places were already “virtual” in a sense – they first existed in the imagination of the authors who created them, and then in the minds of readers who interpreted them. As such, these spaces take on multiple forms and meanings. To this, a second layer of significance is added to the use of the technology itself, as Bandi correctly pointed out. Representing them through a single, shared visual form in VR introduces both creative challenges and interpretive responsibilities that must be carefully considered.

2.3 Analysis of weaknesses and strengths of the use of the VR solution for the Digital Narrative of a Literary Poem

The application of Virtual Reality as a medium for the digital reinterpretation of literary works arises opportunities and challenges related both to the nature of the content and to characteristics inherent characteristics to the technology itself.

First, several limitations must be acknowledged. The absence of a physical reference model means that everything must be created from scratch, demanding significant interpretative and creative effort. Furthermore, the visual rendering of literary content carries the risk of oversimplifying or misrepresenting the symbolic and stylistic richness of the original text. Representing abstract concepts or stylistic and rhetorical features visually can be particularly problematic. The immersive and highly sensorial nature of VR might also lead to sensory overload, shifting the user's focus toward entertainment rather than deep literary reflection. Another concern lies in the inherently subjective nature of literary imagination. Translating it into a single visual and interactive experience might unintentionally reduce interpretative plurality, potentially forcing the creation of a new, shared literary archetype, an issue that touches crucial themes in history of literature, semiotic and psychology.

Translating a literary text, especially poetic or symbolic literature, into a single visual and interactive experience inevitably implies a process of interpretive selection. This process may unintentionally constrain the multiplicity of meanings that a written text allows, particularly in literary works that thrive on ambiguity, metaphor, and subjective imagination. In doing so, the VR adaptation may impose a specific narrative trajectory or visual iconography, potentially reducing the interpretative plurality that is central to literary experience. As Ryan analyzes [Ryan01], the shift from text-based narrative to immersive and digital narrative, highlighting how new media transform the relationship between text and reader, and how digital immersion

can strengthen sensory presence but also limit the semantic ambiguity inherent in literature. This concern aligns with semiotic theories discussed by Umberto Eco, who emphasized the concept of the "open work" (*opera aperta*) as a cultural artifact designed to encourage multiple readings and personal interpretations rather than impose a fixed meaning [Eco62]. In Eco's view, the openness of a literary text is not a limitation, but rather a feature that invites co-creation and interpretive agency by the reader, something that can be compromised when transposed into a visually and interactively closed system like VR. Moreover, from a psychological and symbolic perspective, Carl Gustav Jung's theory of archetypes [Jung68] offers an important framework. Jung argued that certain narrative patterns and symbolic images recur across cultures because they emerge from a collective unconscious. These archetypes are powerful precisely because they remain fluid and adaptable to individual imagination and cultural context. However, when a literary work is reinterpreted through VR, the necessity of visually and interactively defining spaces, characters, and symbolic actions may lead to the formation of a *new shared imaginary archetype*, a visual and experiential construct that solidifies previously open-ended literary symbols into concrete representations.

While this can enrich the collective understanding of the work, it also carries the risk of normativizing interpretation and reducing symbolic openness. This raises a broader philosophical and design-oriented dilemma: while literature engages the reader's imaginative faculties to co-create meaning, VR risks offering a pre-packaged world where interpretive engagement is replaced by navigational interaction. The concept proposed by Murray indicates a specific type of interaction where readers or users explore meticulously designed virtual environments. While they retain some degree of interpretive freedom, this autonomy is inevitably shaped by the rigid architecture of the digital world. Hence, stated the importance of striking a balance between agency and structure, designers must critically balance narrative fidelity with the affordances of immersion, avoiding an overly deterministic rendering of the text. Therefore, particular attention must be paid to the design phase to ensure that this new archetype does not override the diversity of individual meaning-making. The act of “visualizing” literature in VR should not become an act of “closing” the text, but rather a careful and self-reflective gesture that respects its inherent multiplicity [Murray97].

Moreover, the development process is both technically and conceptually demanding as it requires the integration of multidisciplinary expertise, including software programmers and 3D visual artists, UX designers, and literary scholars, to deliver a coherent and meaningful experience. On the other hand, VR

offers several powerful advantages when applied to literary storytelling. It opens new dimensions of human creativity, enabling designers and developers to explore innovative narrative formats that transcend traditional boundaries. VR can render the invisible visible, bringing to life intangible cultural elements such as myths, emotions, and atmospheres – elements that traditionally reside in the reader's imagination. This technology also allows for full immersion: users can “enter” the world of a poem, interact with its spaces and characters, and experience it in a way that transcends passive reading. This multisensory engagement may enhance user attention and accessibility, especially for younger audiences or those who struggle with conventional texts. Lastly, VR can play a vital role in educational and preservation contexts, offering new ways to digitally archive, reinterpret, and transmit both the tangible (e.g., texts, books) and intangible (e.g., historical languages, cultural expressions) aspects of literary heritage.

Building on the preceding analysis of the challenges and opportunities associated with the reconfiguration of a literary episode through virtual reality, the *Furiose Interazioni* project adopted a methodology structured around three levels of reinterpretation. This approach fostered the creation of an interdisciplinary working environment, ensuring a dynamic and balanced collaboration between experts in literary history, technical developers, and UX and interaction designers. The objective was to preserve and effectively convey Ariosto's original message while leveraging the expressive possibilities offered by digital technologies. The specific solutions developed through this methodology will be outlined in the following section.

3 The Journey to the Moon – the station and its objectives

Journey to the Moon is part of a broader initiative called *Furiose Interazioni*, a project designed to offer new ways for younger generations to engage with Ludovico Ariosto's *Orlando Furioso*. Developed as a TICHE technological demonstrator, it results from a long-term collaboration between experts in humanities and digital technologies. The main goal is to create a digital atelier within the Mauriziano Palace in Reggio Emilia, dedicated to exploring the imaginative world of Ariosto through immersive, tech-driven experiences. Launched in September 2023, the atelier serves as a case study for cultural institutions looking to innovate audience engagement. The project unfolds through a station-based approach, a methodological framework where visitors progress through multiple thematic installations, each employing different technologies and interaction modalities to explore various episodes from the poem. This approach allows for both

linear narrative progression and modular engagement, accommodating different visitor preferences and time constraints. The project unfolds through two main interactive paths. *Furiose Interazioni* is more addressed to children and teens and presents episodes from *Orlando Furioso* via four themed stations, each employing specific digital tools and interaction strategies. *Le Stanze dell'Ariosto*, designed for adults, includes two stations focusing on Renaissance archives and digital projects, while also enhancing the experience of the villa's frescoed rooms. Though tailored to different audiences, both paths share a common goal: to enrich the cultural and literary heritage of the villa through digital innovation. The project team addressed design challenges – such as audience engagement, content adaptation, and communication – by developing a framework that integrates cultural sensitivity, technological innovation, and thoughtful interaction design. The positive reception from users across age groups highlights the effectiveness of this approach and its relevance for future digital humanities projects.

Within the atelier, VR is employed not only in the *Journey to the Moon* station. Indeed, in *Furiose Interazioni*'s Station 3 VR allows users to embark on a virtual reimagining of Ariosto's fantastic journey, *Le Stanze dell'Ariosto*'s Station 2 employs VR in a more traditional manner to improve accessibility for visitors with mobility issues. This first experience uses immersive media to bring to life an imaginary space described in the poem, offering an interpretation of intangible cultural heritage that stimulates reflection and emotional engagement. In the second one, VR provides virtual access to areas of the villa that are physically inaccessible due to stairs. Visitors can explore the frescoed rooms through a guided virtual tour, enriched by commentary from experts in literature and art history.

The two applications of VR – one aimed at interpreting intangible cultural narratives, the other at expanding access to tangible cultural heritage – demonstrate the medium's versatility and reflect the dual nature of the project: combining practical, inclusive solutions with imaginative, interpretive storytelling rooted in literary tradition.

4. Methodology and Design Framework

Throughout its development, *Furiose Interazioni* faced several challenges in designing context-aware experiences, defining appropriate roles for technology, and effectively engaging diverse audiences. The team responded to these issues with a design methodology that integrates three key dimensions: theoretical and cultural respect for the content, technological innovation, and a strong focus on interaction design. This framework guided the

project through its stages and was refined through user feedback during early testing phases.

Specifically, all the stations have been designed following a three-layered framework:

- **Theoretical Level:** in respect to Ariosto's poetic vision, structuring the journey in episodic scenes that mirror the poem's narrative flow and themes of wonder and transformation.
- **Interaction Level:** Users embody Astolfo, experiencing the story from a first-person perspective. Two modes of interaction cater to different age groups: a VR headset experience for teenagers and adults, and an interactive physical installation (a chariot pulled by a hippogriff) for younger children.
- **Technological Level:** The VR experience integrates high-resolution 3D environments, spatialized audio, and interactive triggers that guide users through the narrative. The alternative interactive chariot installation allows younger audiences to experience the journey through large screens and tangible interaction elements.

In line with McLuhan's idea that "the medium is the message" [MF01] adapting classical works like *Orlando Furioso* into digital formats calls for more than technological translation – it requires rethinking how interaction, media, and user experience can shape content. This makes interdisciplinarity not just valuable, but essential. In *Furiose Interazioni*, scholars, software developers, and designers work side by side to bridge literary tradition with digital innovation. The *Journey to the Moon* VR station offers a clear example: it involved writing an entirely new script inspired by Ariosto, created collaboratively by literary experts and technical designers. This co-authorship allowed for a VR experience where users do not just watch but become part of the story, stepping into the shoes of a character within the poem. This kind of immersive design would not be possible without the constant exchange between disciplines, each contributing unique perspectives. Ultimately, the fusion of theoretical and technical expertise doesn't just support the project, it fundamentally shapes the station's narrative structure, interaction model, and emotional impact.

5. Implementation and Challenges

Station 3 – *The Journey to the Moon* offers a first-person VR experience of one of *Orlando Furioso*'s most iconic episodes and

stands as a clear example of how the project's creative process was shaped by the constraints and possibilities of the chosen medium. The use of a VR headset introduced several limitations: age restrictions (under 13 discouraged), time constraints (to prevent motion sickness, the experience must stay under 8 minutes), and the significant resources required to design a 3D environment from scratch.

5.1 The two interaction pathways

To address these challenges, the team designed two parallel interaction paths:

5.1.1 a full VR experience with VR headsets (for users aged over 13)

a 360° installation with dual screens (for children under 13), allowing younger visitors to engage safely with the narrative.

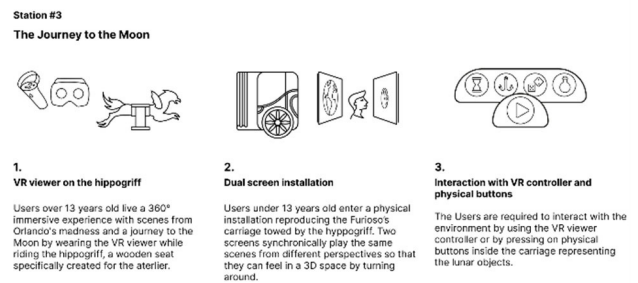


Fig.1: Station 3, *Interactive and immersive flow of the 'Journey to the Moon' experience: VR, physical installation, and tactile controls.*

In the second pathway, users under the age of 13 were invited to step into a kind of camera obscura shaped like the chariot drawn by the hippogriff, as depicted in Gustave Doré's illustrated edition of the poem—a version that has deeply entered the collective imagination. Users who experienced the full VR version, on the other hand, were invited to sit astride a wooden model of the hippogriff, specially created for the project, and placed in front of the chariot it was meant to pull. In both versions, immersion began in the real world: the physical objects and atmospheric staging served as a bridge into the virtual experience. For younger users, the darkness inside the chariot enhanced the sense of immersion, with the two screens – positioned in front and behind – giving the impression of watching scenes unfold through the openings of the carriage. For VR users, the seated, stationary position on the hippogriff helped reduce motion sickness and ensured they stayed safely within the designated VR play area, allowing them to remain fully

immersed in the experience.

In both versions, users become Astolfo, guided by Ariosto's voice through seven scenes that unfold as slow-motion scenes. Initially passive observers of Orlando's story, users later gain control as they fly to the moon to retrieve his lost reason. Finally, users are tasked with "solving" the loss of Orlando's sanity by searching for it on the surface of the moon.



Fig.2: *Rendering of the chariot and of the wooden hippogriff.*



Fig. 3: *Final on-site installation of the wooden chariot and hippogriff.*



Fig. 4: *Orlando is alone in the forest.*

They must choose from a series of allegorical objects—virtual representations based on Ariosto's descriptions, such as an hourglass symbolizing time wasted by humankind, a fishing hook representing the empty promises of hypocrites, or dice evoking time lost to gambling. The lost reason is depicted as a vial, exactly as described in the poem, which must be recovered and returned to Orlando so he can inhale it and regain his sanity. In the first pathway (the full VR experience), users navigate the moon's surface using teleportation, moving with the VR headset's controller. They are free to explore the environment and must actively search for the objects scattered among lunar craters. In the second pathway (the chariot experience), users instead interact with physical 3D-printed buttons shaped like the same objects they see on screen. This form of interaction was designed with younger participants in mind, as they may struggle with control-based navigation but engage more intuitively with tactile, physical elements. In both cases, the experience culminates in the selection of the vial containing Orlando's reason, leading the user to the final scene in which Orlando is shown restored to sanity, once again taking up his sword to fight alongside Charlemagne.

The integration between digital environments and physicality of the installation represents a key design innovation of our use case. Unlike purely digital VR experiences, we deliberately incorporated tangible elements to enhance presence and reduce the cognitive gap between real and virtual worlds. The wooden hippogriff and chariot serve multiple functions: they provide physical orientation cues that help prevent motion sickness, create a ritualistic entry point into the virtual narrative, and offer tactile feedback that grounds users in the experience. This approach aligns with recent research on mixed reality interface [Bil*18], which emphasizes how the use of physical props can enhance spatial orientation, user presence, and overall immersive

comfort in shared virtual environments.

Also, the integration of VR with physical objects was guided by the cognitive and ergonomic needs of its target users – i.e. children between the ages of 3 and 11. Cognitively, younger children (ages 3–6) think symbolically but struggle with abstract reasoning and perspective-taking, while children aged 7–11 begin to develop logical thinking and improved language skills [Liu18]. To support understanding across this range, the installation includes recognizable symbols and familiar references that help anchor Ariosto’s imaginary world.

Ergonomically, younger children (ages 3–5) have limited fine motor skills and benefit from simple touchscreen interactions, whereas older children (ages 6–8) can perform basic gestures like clicking or typing, and those aged 9–11 are capable of more advanced interactions [Liu18]. To accommodate these differences, the design incorporates 3D-modeled buttons representing symbolic objects, leveraging gross motor skills in younger users while remaining intuitive for older ones.

5.2 The narrative strategies

The project required a complete reimagining of the episode, with a brand-new script written collaboratively by literary scholars and technical experts. The voice-over narration had to be tightly synchronized with visuals to preserve narrative clarity and immersion, especially since the user never sees their own avatar but only Orlando. Crafting an experience that communicated Ariosto’s metaphor-rich universe also meant visually interpreting symbolic elements, like the objects lost on Earth and found on the moon, while respecting the depth of the poem’s allegories.



Fig.5: *Orlando discovers the love affair between Angelica and Ruggiero*



Fig. 6: *Orlando loses his sanity*

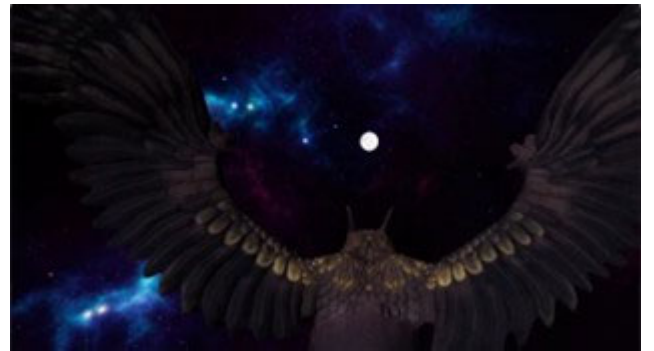


Fig.7: *First-person frame from the Journey to the Moon while riding the hippogriff*



Fig.8: *Landing on the Moon and interactive quest for the vial holding Orlando’s reason. The user experiences the journey in first person as the hero Astolfo.*

The classical structure of *Orlando Furioso*, built around loosely connected cantos, was reshaped into a cohesive story arc under ten minutes. At the same time, the language was adapted to remain accessible to young children without betraying the tone and richness of the original text. To bridge literary and

technological worlds, the team borrowed from cinematic and graphic novel technique, using "voice-off" narration and scene-by-scene "dioramas" to build atmosphere and rhythm.

Our adaptation of the lunar episode demonstrates how the three-layered framework addresses the challenge of maintaining Eco's *open work* principle while creating a necessarily specific visual representation. The allegorical objects on the moon, the hourglass, fishing hook, and dice, were designed as recognizable symbols that still invite interpretation. Rather than providing explicit explanations for each object, we allow users to discover their meanings through exploration and reflection, preserving the interpretive space that characterizes literary engagement. The voice-over narration, carefully crafted in collaboration between literary scholars and writers, maintains Ariosto's poetic register while ensuring accessibility for younger audiences. To further preserve the interpretive openness advocated by Eco, we employed several specific design strategies. First, we reconstructed only partial environments, dioramas rather than complete scenes, providing just enough visual context to suggest the setting while leaving space for imagination. Second, we utilized evocative soundscapes rather than literal sound effects, allowing emotional resonance to guide interpretation. Third, we employed symbolic color palettes and lighting that correspond to emotional states rather than realistic representation, such as the red-tinted scenes during Orlando's madness. Through these choices, we deliberately shifted from explaining the literary work to facilitating its emotional interpretation, allowing each user to construct personal meaning within the guided narrative framework.

This station clearly illustrates how a multidisciplinary process, merging narrative writing, visual design, historical-literary insight, and technical execution, does not simply support the experience but actively determines its final shape. The depth of collaboration made it possible to retain the poetic essence of Ariosto's work while embracing a new medium capable of expressing its imaginative power.

6. User Testing and Qualitative Evaluation

Preliminary user testing involved children, teenagers, and adults to assess usability, engagement, and learning outcomes. Observations, direct feedback, and semi-structured interviews revealed several key insights.

Initial testing sessions were conducted in collaboration with expert partners in childhood education. These sessions involved small groups of users (3-4 children) divided by age groups (3-5 and 6-12 years) who, accompanied by educators, experienced the designed interactions across various stations. As observers in

these sessions, we collected qualitative data on user experiences, noting evidence of learning, engagement, and expressed desire to repeat the experience. These preliminary insights informed iterative design improvements before the public launch. Following the preliminary phase, during public opening days, we gathered feedback from over 100 visitors (adults and children) who experienced Station 3 as part of guided tours in small groups. Participants were recruited through local schools and cultural institutions, with efforts to include users with varying levels of familiarity with both VR technology and *Orlando Furioso*.



Fig.9: User test session inside the chariot as the 360° installation with dual screens

First, VR significantly enhanced emotional involvement and memory retention across all age groups. Many users, especially children, demonstrated an ability to recall narrative elements and associate them with broader thematic concepts, facilitated by vivid virtual representations. Symbolic elements such as the vial of lost reason or the red-tinted scenes illustrating Orlando's rage proved effective in fostering both emotional identification and

cognitive anchoring. Adult participants exhibited unexpected levels of playful engagement and wonder. Many adults reported experiencing a "wow effect" [Arc*20] when seated on the wooden hippogriff, describing the sensation of flying through space as both thrilling and meditative. The transition from Earth to moon, watching the Earth recedes while the lunar surface approach, emerged as a particularly impactful moment, with adults frequently expressing surprise at their own emotional investment. Upon landing on the moon, adult users demonstrated behaviors typically associated with younger participants: playful exploration, verbal expressions of delight, and a sense of discovery that transcended their initial expectations. This suggests that the embodied nature of the experience successfully bypassed adult inhibitions, allowing for genuine moments of wonder and imaginative engagement.

The emotional response for younger users was especially pronounced during the depiction of Orlando's madness, where visual and auditory cues, such as the dominant use of red hues and dynamic soundtrack, heightened users' immersion, and empathetic engagement. Children readily embraced the narrative challenge of recovering Orlando's reason, accepting it as an active mission rather than a passive task, suggesting that the interaction model successfully translated literary objectives into motivational gameplay dynamics.

The alternative chariot installation effectively engaged younger users, ensuring accessibility without sacrificing narrative immersion. The tactile interaction through 3D-printed buttons, combined with synchronized audiovisual storytelling, allowed even the youngest participants to experience a sense of agency. The need for integration emerged after the first rounds of testing: during the narrative moment of complete darkness, just before users "mount" the hippogriff, some younger children, particularly those aged between 5 and 7, exhibited signs of fear due to the intense emotional engagement.



Fig. 10: *User test session of a full VR experience with VR headsets*

To mitigate this effect without compromising immersion, a subtle strip of blue-toned LED lighting was introduced in the chariot. This continuous, low-intensity illumination, evocative of the lunar and cosmic setting of the story, provided a gentle ambient reference point, helping to maintain a reassuring environment while preserving the atmospheric quality of the experience.

Additionally, the design choice not to immediately reveal the correct object (the vial) maintained narrative tension and fostered exploratory behavior. This decision encouraged users to actively interpret the allegorical objects, supporting both cognitive engagement and narrative immersion.

Overall, combining VR and tangible interactions enriched the overall experience, making the story accessible to a broad

audience spectrum while preserving the poetic complexity of the source material. These findings align with recent research identifying VR as particularly effective media for eliciting experiences of awe and the sublime, emotional states that trigger imaginative processes fundamental to creativity and curiosity [Chi*18]. Careful attention to aesthetic design in our VR interface appears to generate a specific form of "wow effect" that paradoxically combines pleasure with a form of productive disorientation. This aesthetic experience creates a cognitively intense satisfaction that users desire to repeat, suggesting that the slightly destabilizing nature of the virtual journey, moving through impossible spaces, experiencing scale shifts, embodying another character, enhances rather than diminishes engagement. This finding has important implications for future VR literary adaptations, indicating that embracing the medium's capacity for beautiful disruption, rather than pursuing seamless realism, may be key to creating memorable and transformative cultural experiences.

7. Conclusion and Future Directions

This study highlights the potential of VR to enhance cultural heritage storytelling, by reactivating the imaginative and participatory dimensions of literature. Through a carefully designed multidisciplinary approach, *Furiose Interazioni* demonstrates how immersive technologies can render complex cultural narratives both accessible and emotionally compelling for diverse audiences. Our contribution to the field of immersive digital heritage is threefold. First, we demonstrate that VR can successfully translate intangible literary heritage while preserving interpretive openness through careful design strategies. Second, we show that integrating physical and digital elements significantly enhances user engagement and reduces common VR discomfort issues. Third, our results indicate that embodied interaction in literary VR experiences produces improved learning outcomes.

The project's success in engaging both VR-naive users and those unfamiliar with *Orlando Furioso* suggests that carefully designed immersive experiences can serve as effective entry points to complex cultural content. The differentiated interaction pathways, VR for older users and physical-digital hybrid for younger audiences, provide a scalable model for inclusive cultural heritage design.

By combining theoretical respect for the original literary source, innovative interaction design, and inclusive technological solutions, the project offers a scalable model for future applications in the digital humanities. The integration of tangible and virtual interaction pathways proved crucial for ensuring

accessibility and sustaining the narrative's symbolic richness across different age groups.

Future work will explore the development of multi-user VR experiences, enable collaborative storytelling, and foster shared emotional engagement. Additionally, adaptive storytelling techniques, where the narrative dynamically responds to users' choices and emotions, will be investigated to further personalize and deepen user experience. Plans for the future involve also conducting longitudinal studies to assess the long-term impact of VR literary experiences on cultural literacy and to develop design guidelines for adapting other classical texts to immersive media. Furthermore, an interesting topic of research is to explore VR's capacity to induce states of awe and sublime disorientation, emotional states traditionally associated with mystical or transcendent experiences, through careful attention to aesthetic visual rendering, transitions, and narrative pacing.

The findings contribute to the growing discourse on immersive digital heritage, offering insights into how literary imagination and digital technologies can converge to create new forms of cultural transmission and experiential knowledge. As digital humanities continue to evolve, the presented work suggests that the thoughtful integration of emerging technologies can enhance rather than diminish the richness of literary heritage, opening new pathways for cultural engagement in the 21st century.

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Keywords: Virtual Reality, Digital Heritage, Intangible Heritage, Immersive Storytelling, User Interaction, *Orlando Furioso*, *Renaissance Literature*

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