Appropriating Technology for Interactive Media in Theatre: Design Strategies and Aesthetic Insights

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ABSTRACT
This paper investigates interactive media design as a narrative agent in theatrical performance through a practice-based design approach. We clarify the role of the Interaction Director in the production team and examine challenges in appropriating technology for theatrical interaction design. A two-layer workflow is proposed, integrating macro-scale conceptual design with micro-scale cue-to-cue interaction mapping. We address the mutual dependency among creative disciplines, highlighting the collaborative processes necessary to resolve conflicts during the design and rehearsal stages. Furthermore, we adopt a scenographic perspective to analyse how interactive media contributes to dramaturgical storytelling by crafting visual and auditory metaphors. We contextualize interaction design with reader-response theory and the horizon of expectations, demonstrating how interactive media fosters collaborative creativity and expands the narrative potential of theatrical storytelling.

Author Keywords
Interactive media, theatre design, storytelling, interdisciplinary collaboration

1. INTRODUCTION
Interactive technology has been extensively studied within performance arts, particularly in fields such as dance, live instrumental or electronic performances, and performative installations. However, less attention has been paid to exploring interactive technology as a creative tool for theatre design. Theatre, being a "Gesamtkunstwerk" - an all-encompassing art form - integrates various disciplines such as music, drama, visual art, and dance into a unified whole. In this context, interactive media serves not as the focal point but as one design element among many, working in harmony to shape the theatrical narrative and create a singular artistic experience.

This paper explores the interdisciplinary design methodologies and aesthetic frameworks that emerge when appropriated technologies are integrated as a tool for theatre-making. Specifically, we explore how virtual reality (VR) technologies can be repurposed to create interactive media experiences that align with the broader artistic vision of the production.

While specific technical implementations are discussed where relevant, the paper does not aim to introduce novel interaction techniques. Rather, it investigates how interactive media can function as a dramaturgical and scenographic element within theatre, contributing to a unified narrative design and cross-disciplinary collaboration. Our emphasis is on interactive media as a compositional and conceptual tool, offering a holistic design perspective that supports the expressive, collaborative, and aesthetic dimensions of live performance.

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1.1 Appropriation
Within the context of third-wave HCI, "appropriation" refers to the process where technologies are adapted and adopted beyond their original design purpose [1]. Dix [2] highlights the advantages of appropriation, emphasizing its flexibility in modifying technology to suit specific environments and evolving conditions. This process not only addresses practical constraints but also fosters a sense of ownership among users.

In the field of interactive technology in dance, appropriation is often needed because of the demands to design creative tools for interaction. Masu et al. [3] associate appropriation with ambiguity, suggesting that the inherent ambiguity of artifacts can facilitate the process of appropriation. At the same time, appropriation can present challenges, such as inaccuracies, deviations from the initial intent, and difficulties in maintaining robustness [4]. This study extends to the discourse on appropriation by analysing its practical implications within theatre, where integrating interactive media often necessitates repurposing technology in innovative ways.

1.2 Interactive Theatre Design
As noted, the exploration of interactive technology in theatre lags behind its application in other live performance art forms. Baalman et al. [5] attribute this disparity to the limited collaboration between theatre practitioners and technologists, particularly when compared to fields like dance, where individual artists or researchers working between the fields of computer music and dance often collaborate closely. They further state that although real-time interactive techniques in theatre are recognised as powerful tools, their integration remains under-researched [5].

This research identifies two primary challenges to integrating interactive media into theatre. First, the storytelling potential of interactive technology in theatre has not been fully realized. In some cases, researchers view performances incorporating digital media as a distinct genre separate from traditional theatre. Works such as Digital Performance [6] and Computers as Theatre [7] focus on how technology can serve as a central creative component of performances. However, when interactive technology takes centre stage, it risks overshadowing the narrative and shifting the focus toward technological innovation rather than storytelling. Conversely, interactive technology can also assume a more dramatic role, serving as a storytelling agent that interacts either with the performers [8] or audiences [9]. This approach often creates participatory, video game-like experience that emphasize interactivity and playability over traditional theatre narrative.

This study takes a different perspective by positioning interactive technology as a design tool that blurs the boundaries between traditional theatre design disciplines - set, costume, lighting, sound, and projection – rather than as a standalone focus. Building on Wagner's Gesamtkunstwerk theory, we propose that all elements of theatre, including interactive technology, must harmonize into a unified whole to create a

singular artistic experience. The key question is how interactive technology can seamlessly integrate with traditional design elements, complementing rather than competing with them, to serve the narrative and enhance the overarching experience.

Second, the cross-disciplinary nature of interactive technology often conflicts with conventional theatre production workflows. Traditional design departments typically develop their creative practice independently[1]. While weekly production meetings provide opportunities for departments to update their progress and exchange ideas, the interference is quite limited and true interdisciplinary collaboration happens until the technical rehearsal phase. In contrast, integrating interactive media requires interdisciplinary collaboration from the earliest stages of production. Gonzalez et al. [10] describe the "integrated process" as one of the design disciplines they developed for prototyping interactive media in dance, emphasizing the close coupling between choreography and technology, where the collaboration was so tightly intertwined that certain sections of the dance could not be finalised until the interaction sections were fully developed. Extending this methodology to theatre, where more design disciplines such as set and sound are involved, further complicates the decision-making process. This research proposes a new production workflow to address these challenges and facilitate the effective integration of interactive technology into traditional theatre practices.

2. RELATED WORK

This research examines interactive technology in live performance from two perspectives: technical and perceptual. Technically, it explores the process of technology appropriation within interaction design for live performance. Perceptually, it investigates how interaction design integrates into theatrical workflows to create unified narratives. To structure this research, we identify two key areas of related work that shape our approach: control-driven interaction and content-driven interaction.

Control-driven interaction focuses on the internal components of interactive technology, such as input, output, and mapping. In contrast, content-driven interaction situates interactive technology within the broader context of the performance's content. In another word, projects adopt a content-driven focus embrace the potential of computational interventions to augment dramaturgical content [8]. Rather than creating a taxonomy of interaction in performance, this study uses these two categories to evaluate how interactive technology is implemented and how different research focuses contribute to the analysis and inspiration of our production processes.

2.1 Control-driven Interaction

In Human-Computer Interaction (HCI), embodiment encourages users to embody their praxis through technology [11]. The control mechanisms in interactive technologies facilitate explorations of body-centred design, emphasizing the potential of body movement. Since Dourish [12] introduced embodied interaction as a foundational concept for interactive system design, this paradigm has been widely applied and expanded, particularly in the field of interactive dance. Höök et al. [13] integrate Somaesthetic theory into interaction design, opening a design space that fosters inward bodily inquiry, and encouraging a first-person perspective design approach. Somaesthetic theory has since inspired subsequent research across diverse dimensions, including movement fluidity [14], Laban movement quality [15], kinesthetic awareness [16] and invisible physiological sensations [4]. These studies raise awareness to specific aspects of bodily consciousness, which enriches the scope of research relating to the input aspects of interaction design.

Research focusing on the output of interactive systems often emphasizes result-driven elements, including dramaturgical context [5], aesthetically pleasing musical outcomes [17], and complex yet comprehensible projections [18]. Designers may need to evaluate the design intent and desired result before determining technical approaches, such as choosing sensing devices or input parameters [5]. Result-driven interaction design also inspires investigations into how interaction design influences and supports across different departments within a performance ecology, For instance, the ARCAA analytical framework examines these interrelationships in depth [19].

Research on control-driven interactive media provides valuable insights into strategies for selecting input and output data, as well as analytical methods for investigating embodied consciousness and achieving specific interaction outcomes. However, while these technical aspects are crucial, this research believes that the contextualisation of interaction design in theatre storytelling requires an additional conceptual layer of considerations: the narrative responsibility that interactive media must serve within the broader content and context of the performance.

2.2 Content-driven Interaction

In the context of third-wave HCI, interaction design has increasingly focused on contextualisation, addressing issues such as meaning, complexity, culture, engagement, and experience [11]. Academics and practitioners recognise that interaction in performance requires integrating interaction design as an integral storytelling component. Coniglio [20] identifies their work as content focused, distinguished from other works merely exploring interactive materials. He advocates for a "theatre of ideas" where all materials work cohesively to support the narrative's core. He disputes "full interaction" by clarifying that their primary aim is to explore the narrative arc throughout, incorporating design elements selectively to enhance the aesthetic intent of the piece. Similarly, Bluff and Johnston [18] argue that storytelling across multiple elements yields more meaningful results than focusing on the efficiency of a single medium. This perspective towards interaction aligns with our approaches of integrating interactive media in theatrical productions, where interaction design is considered one of the design elements alongside other design principles to serve the piece's thematic intention, rather than as a continuously reactive system. However, further research is needed to explore how interactive artifacts can foster a joint expression and cohesive storytelling across departments in theatre [19].

In theatre, interaction design serves as a potent agent for narrative development. Friederichs-Büttner et al. [9] briefly note its ability to create new means of storytelling and expand traditional dramaturgical possibilities: digital scenery can synchronize with performers' actions, algorithmic manipulation can blur the linearity of a drama, and interactive technology can directly involve the audience in creating the piece. Drummond [21] highlights the flexibility of interactive system in creating dynamic sonic temporal structures while preserving the integrity and overall identity of the individual work. He also observes that interactive systems also blur the boundaries of traditional roles. Salselas et al. [22] underscore the role of sound design in contributing to the creation of immersive environments, enhancing emotional engagement, decreasing critical distance, and inducing an illusionary sense of "being there". In non-linear digital media, sound design can also induce narrative shifts by directing audience attention to a certain location with the sensation of agency. This capacity for narrative orientation reinforces the role of interaction design as an active dramaturgical element. Building on these insights, we

[1] A sample production schedule is given by the School of Dramatic Art at the University of Windsor on: https://www.uwindsor.ca/drama/676/sample-production-schedule

understand interactive technology not only as a narrative component, but also as a medium for aesthetic expression in performance design.

Salter et al. [23] address the complexities of designing and implementing interactive media in theatre by proposing two levels of mapping scale: the Meso scale (standalone mapping systems), and the Macro scale (temporal-structural organization of interactive events). They argue that the Macro scale is crucial for an audience's understanding of a performance's unfolding narrative. Mapping strategies must balance the interplay between compositional and dramaturgical structures, guided by higher-level narrative frameworks. Simultaneously, emergent improvisation between live performers, the environment (understood through sensing techniques), audience and computationally assisted structures must be explored to create dynamic storytelling. To address these complexities, Salter et al. propose design approaches including dynamical system and sequenced interaction, facilitating narrative progress that is legible, logical, and unpredictable. Aligning with this viewpoint, Bergstrom and Lotto [24] introduce Mutable Mapping, a strategy in which mappings are adjusted during performances to create suspended expectations, facilitating tension and release in the narrative progress which both are crucial aspects of aesthetic and visual music narratives. These mapping strategies, developed to deal with the challenges occurred with the integration of interactive media in theatre, inform our design process, as detailed in the following section.

3. DESIGN PROCESS

The two theatre productions discussed in this research are the degree projects of the first and second author, titled *Pangu* and *Origin Essence*, respectively. The artistic intention of *Pangu* is to integrate interactive media into the storytelling, in which we appropriate HTC Vive system[2] - originally designed for VR gaming - as a motion-tracking device. Building on the lessons learned from *Pangu*, we continued exploring the Vive system in *Origin Essence*.

Figure 1. Production photo from *Pangu*

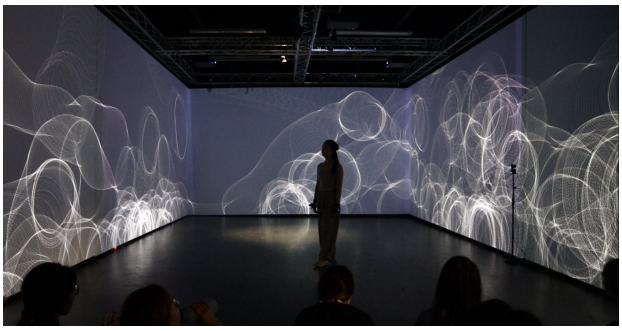

Figure 2. Production photo from *Origin Essence*

3.1 Directing the Interaction

This research positions interactive media as a core design principle alongside traditional theatrical components such as scenery, costume, lighting, sound, and projection. The content of interactive media, in collaboration with these elements and performers' staging, collectively shapes the performance as a cohesive whole. Unlike conventional theatrical workflows - where design departments typically operate independently until the technical rehearsal phase – productions involving interactive media require seamless collaboration of all departments from the very beginning of production.

Traditionally, theatre directors oversee all production aspects and hold ultimate decision-making authority. However, integrating digital technologies into theatre introduces contemporary challenges for directing [25], as technical expertise in interactive systems remains relatively uncommon among theatre directors. Simultaneously developing interactive systems while engaging in production dialogues about creative decisions poses significant challenges for interaction designers as well. Johnston and Bluff [26] hypothesized that a supplementary production team role, namely the *Interaction Director* could facilitate the integration of interactive systems.

Through an iterative design process, this research identifies two distinct directing roles - the Artistic Director and the Interaction Director - and specifies their respective role responsibilities. The Artistic Director focuses on conventional directing duties, ensuring that all dramatic elements – including performer's movements, scenery, costumes, lighting, sound, and projection – align with the production's aesthetic and narrative goals. The Interaction Director, by contrast, oversees technical design and coordinates cross-disciplinary collaboration, ensuring that all dramatic elements integrate cohesively with interactive media to create a unified and dynamic interactive storytelling experience.

Our observations indicate that while interactive media design directly engages in the creation of sound, projection, and choreography, it also inherently influences other production departments, such as scenery, costume and lighting, even when certain elements may appear unrelated to interaction content at first glance. For instance, the scenic, costume, and lighting design in *Pangu* involved inclusive design considerations, although these elements are not considered as part of interactive media. Determining the projection surface for interactive animation required close collaboration with the scenic design team to decide the fabric material and layout of the projection curtains. Similarly, costume designers needed to incorporate sensor devices into performers' appearances while ensuring the look aligns with the production's narrative aesthetic. Moreover, interactive animations, which also functioned as illumination sources, significantly impacted the lighting design process and outcomes. Such cases highlight the need for a leading role with both artistic vision and technical understanding of interaction design to conduct this collaborative process.

[2] Product information: https://www.vive.com/uk/product/#pro%20series

This widespread entanglement reveals the need for a dedicated role that can actively participate in creative decision-making across all scenographic disciplines to ensure a coherent integration of interactive media into each department's artistic vision. While Johnston and Bluff [26] conceptualize the Interaction Director primarily as a liaison among directors, choreographers, and performers, our study suggests that the role demands a broader responsibility, requiring deep engagement with cross-disciplinary design processes, technical understanding, and aesthetic sensitivity. In this context, designing interaction closely resembles directing, requiring interdisciplinary knowledge and comprehensive coordination across departments.

3.2 Design with Appropriation

While existing research on *design for appropriation* [2] emphasizes the creation of adaptable artifacts for end-users, our approach - design with appropriation - focuses on the creative repurposing of existing artifacts not originally intended for theatre. Rather than designing systems that invite appropriation, we began with a lack of suitable tools for live performance interaction, and treated appropriation as a necessary, situated design method. In contrast to frameworks that aim to encourage active appropriation through enabling mechanisms [3], [27], we position appropriation as a deliberate design response and creative strategy for addressing domain-specific production challenges.

Our appropriation of the HTC Vive system unfolded in three stages: first, using Unity within an OSC signal chain to process sensor data; second, streamlining the data flow by developing a custom data receiving module in Touchdesigner, and third, optimizing signal reception by removing the system's built-in dependency on the headset. Beyond the challenges outlined by Fdili Alaoui [4], such as inaccuracies, deviations from the initial intent, and difficulties in maintaining robustness, this research provides detailed empirical insights into the challenges of design with appropriation.

Identifying appropriate tools was time-consuming and required iterative experimentation. In our search for motion tracking solutions that aligned with the dramaturgical goals, we evaluated multiple technologies including the Kinect depth camera and various inertial sensor chips with gyroscopes and accelerometers, before arriving at the HTC Vive system as the most viable option. However, even the "optimal" solution might require design compromises and additional development of artifacts to work around its inherent limitations. Designed primarily for VR gaming, the HTC Vive system automatically enters sleep mode after extended periods of inactivity, requiring manual reactivation during performances. Additionally, its low-level code assumes the presence of a VR headset within close range of base stations. To repurpose the system for theatrical application, we overrode the system's built-in headset dependency. These adaptations reflect both technical and creative negotiation inherent in appropriation. Although the system was initially unfamiliar and introduced inefficiencies, we maintained an error log and calibration guide throughout the development process. This iterative adaptation led to a robust workflow optimized for theatrical requirements, integrating the appropriated artifact seamlessly into our design context.

Despite these challenges, our experience revealed that appropriation is not merely a workaround but a source of creative potential. It broadens the designer's toolkit by enabling cross-domain borrowing, fostering cross-disciplinary innovation. Appropriated tools may possess unintended functionalities and attributes that can inspire unexpected design directions. For instance, the HTC Vive system's various tracking sensor options inspired us to adapt controllers and trackers as both interaction tool and performative props in interactive storytelling. In this way, appropriation enriches the diversity of narrative audiovisual language, introducing new modes of interactive storytelling that traditional theatrical technologies do not offer. Appropriation in this research evolved from a technical necessity into a creative strategy, turning constraints into opportunities and enabling new artistic possibilities.

4. DISCUSSION

4.1 Design for Interactive Storytelling

This study explores how interactive media functions as a storytelling agent within theatrical productions. We found that design elements play multifaceted roles, and interaction design has the potential to serve not merely as decorative or functional features to support actors on stage but as an integral component of the narrative. Theatrical design provides both physical and emotional contexts, situating stories within a particular time, space or mood. It also contributes to character development, visually or auditorily conveying personality, social status, or psychological state. For instance, a character's transformation over the course of a narrative may be visually or aurally reflected through changes in design elements, such as lighting or music, reinforcing storytelling arcs with dynamic design changes. Furthermore, design elements enhance narrative dynamics by manipulating the flow of the story and guide the audience's focus.

Our findings support the notion that effective storytelling emerges from the integration of all dramatic elements [18]. Moreover, alternating the primary storytelling agent among these elements fosters evolving narratives and creates dramatic tension through surprise and suspense. Interactivity also enables performers or audience to shape storytelling in real-time. This ability introduces a sense of unpredictability that mirrors the liveness and dynamics of theatre. Theatre design works on a symbolic level, condensing complex and abstract aesthetic ideas into visual or auditory metaphors that invite the audience to interpret narrative in imaginative ways and immerse themselves in the story on a deeper level.

Building upon these conceptual insights, we developed a two-layer workflow for designing interactive storytelling, structured to address both macro-level conceptual alignment and micro-level interaction execution. On the macro scale, we utilized a holistic design framework to align cue-based design principles including sound, lighting, projection, and interaction across the entire piece. For instance, using a unified **design sheet**, we divided the script of *Pangu* into seven smaller scenes, and determined core emotional tones and corresponding preliminary design ideas. Based on the dramaturgical function of each design element, we then identified the primary storytelling agents for each scene, such as performer movement, spatial position, music or live instrument, or interactive projection, and derived potential input and output modalities for the interactive system accordingly. This framework enabled coherent narrative pacing and facilitated straightforward cross-disciplinary design communication from an early stage.

Once the macro-scale framework was established, we transitioned to the micro scale, where detailed cue-to-cue mapping sequences were defined. This layer focused on the precise linking of input parameters (e.g., movement parameters, instrument signals) to output elements (e.g., projection effects, sonic layers). While mapping is recognised as the most essential component of interaction design in both interactive dance [28] and algorithmic composition [23], we designed dynamic mappings inspired by Mutable Mapping [24] and created a diverse parameter space for moment-to-moment interactivity. In *Pangu*, for example, we incorporated a variety of inputs including electroacoustic instrument signals, individual music stem signals, and motion data from Vive controllers and trackers, and mapped them to outputs such as granulator synthesis parameters, MIDI control messages for scene change, and generative visual parameters. These mapping sequences allowed narrative meaning to unfold through temporal variation and evolving input-output relationships. Together, the two layers enabled a balance between conceptual intention and technical implementation, preserving narrative clarity while supporting interactive complexity. More importantly, this workflow offered an effective strategy to address the interdisciplinary nature of interactive design in theatre,

ensuring that all departments contributed meaningfully within a shared narrative structure.

4.2 Mutual Dependency

Our interactive media design includes a diverse input/output mapping parameter space, incorporating elements such as movement sonification/visualisation and sound visualisation, where sound, projection, and choreography departments directly engage in the design phase as inputs and/or outputs within the interactive systems. Despite having a macro-scale framework in place, advancing the micro scale interaction design proved challenging due to mutual dependencies among these disciplines. The interconnections among elements often create situations where it was unclear which disciplines should take the lead in the design process.

During the preliminary design and rehearsal phase, we encountered several instances of interdependency conflicts wherein, for instance, interaction designers sought to see choreographed movement to develop the system design accordingly, while the choreographer preferred to understand the visual and sonic outcomes of interaction before determining the movements. To break this deadlock, we shifted the design emphasis from movement-dependent triggers to narrative-driven prototypes. Visual and sound interactions were prototyped based on the script. As a detailed example, in the climax scene of *Pangu*, where the protagonist splits the world with an axe, we intensified the dramatic tension by mapping spatial sound effects of swirling wind and thunder to the tracked movement of the axe (HTC Vive controller) with ambicontrol~ [3] object. These elements were layered dynamically on top of the musical composition to evoke mythological scale and chaos. The production manager scheduled several rehearsal sessions to test and refine the prototypes collaboratively, where choreographers, performers and designers iterated together, adjusting gestural ranges and aesthetic timing based on evolving understanding and mutual feedback. One key takeaway from this process was the openness and flexibility of choreographers in modifying movements while preserving artistic and emotional intent. For instance, in *Origin Essence*, performers readily adapted their movement range based on the interaction director's feedback on how the visualisation of movement could best be represented.

This mutual dependency relationship between disciplines also influenced the technical rehearsal stage. In traditional theatre, cue-based design disciplines can typically adapt quickly due to the flexibility of existing software that supports rapid modelling and modification. For example, sound design software like Qlab allows easy adjustments to the length, fade, or speed of sound cues in order to align with performer's staging. However, our interactive system involved multiple software lacked built-in editing features tailored for theatrical applications. As a result, modifications, such as algorithm adjustments, often had to be made outside of technical rehearsal, creating delays in integrating these changes within the live performance context.

4.3 Within Scenography Aesthetics

Performance analysis research suggests that spectator's perceptual encounter with theatrical performances is experienced as a "wholeness" [29], rather than as dissected component parts. Therefore, the aesthetic contribution of interactive media must be analysed through the lens of scenography, which investigates all aspects of theatrical design with a holistic approach [30].

Scenography, with visual and auditory language, constructs metaphors that embody the narrative's dramaturgical essence. Each design element adds a layer to the narrative, conveying the designers' dramaturgical insights into the play's underlying philosophy. For instance, Di Benedetto [31] highlights costume design as a visual narrative that enhances the actor's ability to portray believable characters. The storytelling responsibility of scenography, therefore, is to build up a metaphorical space – one that is convincing enough to allow the audience to immerse themselves fully in the scene [32]. To this extent, interactive media builds a metaphorical space by carefully selecting and constructing inputs and outputs that align with dramaturgical intentions. The potential of metaphor is heightened in interactive media as it combines visual and auditory metaphor, creating a unique meaning to interpret movement, sound, and imagery.

Interactive media also resonates with reader-response theory [33], originally developed in literary studies and later adopted into theatre study to examine how meaning is generated [29]. This theory posits that a literature work is always "virtual" as its aesthetic value does not exist independently but is produced through a process of interaction with the readers. During this process, readers use their own imaginations to fill in the "gaps" which are left unsaid through "a series of structured blanks". Likewise, interactive media in theatre can incorporate structured ambiguities by creating a loose link between input and output elements, inviting audience to participate in meaning-making by giving them freedom to make their own interpretations and draw their own conclusions.

Furthermore, interactive media resonates with the contemporary "horizon of expectations" among audience. According to Collins and Nisbet [29], while spectators obtain a certain range of socio-political, cultural and philosophical assumptions, the more in tune the artwork is with the horizon of expectations, the easier it will be for the work to be read. As audience in the digital age are increasingly familiar with media technologies, interactive elements are both relatable and engaging. This alignment enhances emotional involvement and narrative comprehension, ensuring that interactive media bridges traditional storytelling forms with modern aesthetic sensibilities.

Ultimately, this study demonstrates that interactive media reshapes traditional theatre by redefining how stories are told and experienced. It bridges established scenographic practices with contemporary digital aesthetics, ensuring that narrative, performance, and technology converge in meaningful and transformative ways. As digital storytelling technologies continue to evolve, the collaborative and interdisciplinary methodologies outlined here provide a framework for future explorations in interactive theatre design.

5. CONCLUSION

This study examined how interactive media can function as a storytelling agent within theatrical performance, emphasizing its integration into the production process. Through two original case studies, we examined interdisciplinary design processes and scenographic aesthetics that integrate interaction as a dramaturgical component. We highlighted the necessity of a new collaborative role, the Interaction Director, and its responsibilities within the production. We proposed a two-layer workflow that integrates macro-scale conceptual planning with micro-scale cue-based mappings. These approaches enabled the coherent integration of interaction design into the workflow as well as storytelling, enhancing both narrative complexity and cross-disciplinary alignment.

Our analysis of mutual dependency among creative disciplines revealed the intertwined nature of choreography, projection, sound design, and interaction. While such interdependence posed creative and logistical challenges, it also fostered

[3] Developed by The Institute for Computer Music and Sound Technology (ICST) in Zurich

collaborative experimentation, driving innovation and deepening artistic integration. This process underscored the importance of flexible prototyping and iterative design in negotiating the shared creative space between disciplines.

We further explored the aesthetic implications of interactive media through the lens of scenography, emphasizing how interactive systems create layered metaphors that extend beyond visual or auditory representation. By constructing immersive and symbolic environments, interactive media supports dramaturgical intentions while inviting audiences to participate in meaning-making. Drawing from reader-response theory, we highlighted how structured ambiguities in interactive media allow spectators to engage actively, fostering personal interpretations and deeper emotional involvement.

6. ETHICAL STANDARDS

This research was supported by multiple academic departments at Goldsmiths, University of London, which provided funding and technical assistance. All creative and technological practices described in this study adhered to standard ethical procedures. All participants involved in the productions were fully informed about the use of interactive technologies, and appropriate safety measures were implemented throughout the production process to ensure their well-being.

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