A LocoLudo Approach: Locative Hypertext Ludonarrative

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ABSTRACT

As Hypertext research expands to understand linked play in games and linked locative storytelling in mixed reality as forms of Hypertext there is a need for more refined theoretical frameworks to understand mixed reality play as a storytelling medium, and inform its design. "Ludonarrative" (literally "play story") is often used in game design to understand the poetic qualities of play as a narrative medium. However, in its own field research on this is limited with poetic design and ludonarrative explored from a variety of angles, and even more limited work on the approach for mixed reality. In this position paper we seek to start a dialogue on the ludonarrative qualities of mixed reality and an initial framework for work in this area. Our framework begins to unify existing approaches to ludonarrative through four aspects (semblance, emphasis, subversion, outcomes) which we use as a lens on an initial survey of mixed reality mechanics (movement, space/context, transreality, and social) to explore mixed reality ludonarrative potential.

CCS CONCEPTS

• **Human-centered computing → Human computer interaction (HCI)**;

KEYWORDS

Mixed-Reality, Locative Games, Ludonarrative, Game Poetics

1 INTRODUCTION

Hypertext research has long had a close involvement of interactive art including hypertext fiction [34], hypermedia films [31], and more recently expanding its understanding of Hypertext to include games [18, 19]. These works fundamentally explore the link as a creative medium, taking existing creative traditions such as literature, film, comics, and others and exploring the creative and poetic questions of stories made of interconnected non-linear content and interactions that have been described as ergodic [1], esoteric [23],

and feral [35]. The form of this link is not limited to blue underlined text, they can be spatial [5, 13] or spatio-temporal [32], they can be navigation in interactive video [31], and they can be actions played in a game [18].

There becomes a question then of how we best poetically use these links and interactions to tell a story - Hypertext narrative is not merely a book with links, the link structure, their presentation, and the forms they take are in a McLuhanist [17] way inherently part of the story. Mason and Bernstein among other have already explored how the style of link can carry narrative effect and a range of different stylistic techniques [14], but when it comes to play the complexity of the interaction increases and so does the opportunities for it as a narrative medium. In game design there are a number of labels for describing the design of interactions for carrying poetic and/or narrative content: ludonarrative [8, 29], game poetics [10, 12, 22], mechanics as metaphor [2, 27] - each label used by slightly different communities and in slightly different contexts to describe slightly different techniques but collectively with same form and purpose: to communicate story, emotion, or theme through the design of a mechanic, interaction, or rule of a game - to use the play itself as the medium (or as Mitchell puts it "the narrative mode" [21]). In this paper we use "Ludonarrative" as our own preferred label for this practice as we feel it is more encompassing than the constraints that the words "poetics" or "mechanics" might imply, but this is a semantic preference and our work does not exclude but rather includes the design philosophy behind game poetics and mechanics as metaphor.

This becomes all the more relevant when we understand in recent years the increasing overlap in work between not just Hypertext and games, but also Mixed Reality (MR), or (to be more narrowly defined) locative Hypertext [11, 18, 20, 24, 33]. MR narrative hypertext comes with its own interaction design constraints, affordances, and poetic opportunities [25]. As ludonarrative is intrinsically connected to the form of interaction and play it follows that locative play will present its own ludonarrative potential - ergo there is a need in locative Hypertext narrative to not only better understand ludonarrative but specifically locative ludonarrative.

In this workshop position paper we present an approach towards a reified ludonarrative framework, a summary of mechanics and forms of play inherent to mixed reality and locative games, and an initial attempt to bring the two together. We aim to not only share our initial approach on this and explore ways forward, but also motivate discussion on Ludonarrative issues within the narrative and Hypertext research community.

2 LUDONARRATIVE

We begin by understanding the existing best practice in ludonarrative - how systems, mechanics, and interaction may carry narrative

weight. This concept is far from alien to Hypertext Narrative research and there is a body of existing work on how link design and structure might have poetic effect. Work on structural patterns for example such as Bernstein's seminal work [4] document patterns that could emphasise of themes and emotions of a story such as the use of cycles to underpin rumination or server for emphasis or the use of a tangle to communicate confusion or being lost. Similarly the design and style of links themselves can emphasise narrative motion or imply narrative direction as seen in Mason and Bernstein's work [14] - this might be anchor positioning to imply stasis or action, or cycling anchors to show consideration of options in a decision.

Consideration of choices leads us to also consider Mawhorter's (and colleagues) work on choice poetics [15, 16] where beyond links and anchors we consider how choices are presented and delivered in game narrative. They consider mode (the context of the choice within play), idiom (the form of the choice), and experience (the outcome and what is achieved by the choice) of a game choice. There are a range of poetic applications here from creating drama through undesirable dilemmas, the use of false choices to convey a lack of self-control, or emphasising regret through outcomes for which the player is responsible. Mawhorter's work explores how the presentation and form of a choice within a games story can itself carry the themes and narrative of that story.

Other works also explore the idea of the form of gameplay as narrative delivery. Grace [10] explains in his work how game mechanics are made up of verbs ('jump', 'shoot', 'take', 'grow') which in turn can fit within the poetic rhythmic structure of a game where levels are stanzas and the pace of interactivity sets the meter. This rhythmic meter can itself carry the themes of a work and the relaxed gentle pace of Flower[1] is as much a part of its narrative as the varied cut and thrust of Nidhogg[2] or the rapid aggressive action of Doom[3] is a part of theirs. Grace also notes that the form of the mechanic can include poetic devices such as metaphor, simile, or personification. A sliding block puzzle mechanic can itself carry narrative if we use personification to have the shapes and movements of those blocks reflect the personalities of characters as we seen in Thomas was Alone[4], or a puzzle platformer can gain a time control mechanic to serve as a metaphor for regret and memory as seen in Braid[5]. Rusch [30] also explores this idea of the metaphorical mechanic through what he calls "Experiential Metaphor" where gameplay mechanics can become a "physical visualisation of abstract ideas" - swinging on a grappling hook from platform to platform becomes a visual metaphor for letting go of the status quo and the thrill of risk. Others have similarly explored the metaphorical and poetic device qualities of mechanics in a similar way, and it is important here to note both the work of Begy [2] and Chew and Mitchel [7].

This is not limited to academia and game design practitioners have also explored the poetic and metaphorical qualities of game mechanics. Jason Rohrer's reflections [28] on his own game Passage note the use of movement mechanics as a metaphorical representation of a lifetime, and James Portnow has similarly explored

the notion of mechanics as metaphor [27]. Stephane Bura takes a slightly different approach to the narrative potential of systems in his work on Emotion Engineering [6] where he explores the emotional impact of creating systems that work on three states (Freedom, Mastery, and Data) at three levels of the game design (Action, System, Self, and Social). Bura explains how mechanics are essentially state transitions within the games state machine and that the transition of one state to another can effectively induce emotional resonance - for example a mechanic on the system level that starts with low freedom but increases it (such as developing a new structure with more choices in a strategy game) can create the emotion of hope. Ultimately Bura's approach is about context and outcome and while it attends to mechanical gameplay as Grace and Rusch do, it is perhaps more similar in its focus on change and transition to Mawhorter's work.

The final piece of best practice surrounding ludonarrative that we will cover is defamiliarization. The nation was first coined by Shklovsky in literary theory as a technique of subverting expectations in order to draw attention and encourage reflection, in ludonarrative it is used in a similar manner in that subverting players expectations of play draws their attention to the poetic significance of that subversion. While this has been explored in game design in a number of works [8, 9] perhaps the most comprehensive work on this is Mitchell et al. [22] where they use close reading to identify and categorise a range of examples of defamiliarization in game design under five core approaches (Interaction, Gameplay, Agency, Time, Boundaries) and the poetic significance of defamiliarization as a technique. Examples include how through defamiliarized interaction Brothers: A Tale of Two Sons[6] uses both unfamiliar controls (controlling two avatars simultaneously) and unexpected changing of controls (when one brother dies suddenly only half the controller is needed) to explore both a close relationship and the pain of loss. At the heart of defamiliarization is the subversion of common and expected interaction patterns - games, with their repeated loops of common interactions, are particularly well suited to establishing well ingrained expectations in play and consequently well positioned for maximum impact in subverting those expectations by changing the rules of the game or delivering play in unexpected forms. Whereas in mechanics as metaphor the shape and rules of a mechanic can deliver narrative or theme, in defamiliarization the way in which the interaction is changed or unexpected carries the narrative instead.

Ludonarrative, as we have outlined in this short exploration, is varied and somewhat scattered in its best practice. In his chapter in *The Authoring Problem* Mitchell suggests there are two overall approaches in metaphor and poetics [21], which metaphor covers mechanics as metaphor and poetics is largely concern with defamiliarization. However, a broader model might be concerned less with technique and more with the aspect of the mechanic that is conveying narrative or thematic meaning. Our model presents ludonarrative in terms of Semblance, Subversion, Pattern, and Product:

- *Semblance* refers to the form of the mechanic resembling the theme or narrative content delivered such as in the use of metaphor or personification.

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[1]Thatgamecompany, 2000
[2]Messhoff Games, 2014
[3]ID Software, 1993
[4]Bithel, 2012
[5]Blow, 2008

[6]Starbreeze Studios, 2013

- *Subversion* refers to the way a mechanic subverts expectation as in defamiliarization.
- *Pattern* refers to the context within which the mechanic is used such as in repetition for emphasis or sequential structures such as cycles.
- *Product* refers to the outcome and the way execution of a mechanic changes the state of a game and its impact.

In this way we discuss ludonarrative less in terms of a loosely related collection of techniques and more in terms of the four parts of a mechanic we may design for narrative effect. Some techniques discussed above refer to a single aspect of this model: defamiliarization works through subversion, metaphor and personification through semblance - others through multiple parts: Mawhorter's poetic choices and Bura's emotion engineering are matters of pattern and product. While all four aspects are concerned with the ludonarrative design of a mechanic some of them are concerned with its intrinsic qualities such as Semblance, some with the extrinsic context outside of the mechanic but surrounding its use such as Pattern, and some on the interface between both the intrinsic design of the mechanic and its extrinsic context in Subversion and Product as we depict in figure 1.
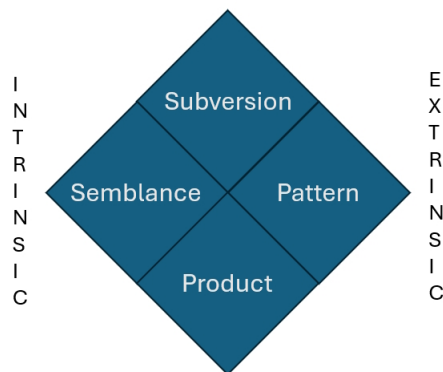

Figure 1: Ludonarrative design through a mechanics Semblance, Subversion, Pattern, or Product,

3 MIXED REALITY MECHANICS

In order to understand how the framework above may apply to mixed reality specifically we need to consider the ludic aspects of that medium. Mixed reality games can, and do, make use of the mechanics of conventional games such as conversation trees from adventure games, puzzles, and collection systems - as such frameworks such as Mawhorter's choice poetics [15] or Mitchell's defamiliarization model [22] may still be used in this context. However, as well as conventional mechanics we must explore the forms of play and interaction that are native specifically to mixed reality.

Table 1 represent and initial survey of native mechanics to mixed reality. It is important to be immediately clear that this is work in progress for discussion at this workshop, it is not a systematic review, it is a categorisation based on works in the authors own

experience - a systematic approach here must be considered essential future work. Its also important to note in summarising native mixed reality mechanics specific to the medium it does not include conventional mechanics that are often used in mixed reality (such as Pokemon Go's collection mechanic) [7].

We present four categories of native mixed reality mechanic:

- *Movement*: Mechanics associated with moving in one reality in order to affect content within another - as commonly seen in works such a locative narrative [11, 24]. This includes the classic locative mechanic of making story choices in the game reality by travel in the physical reality, content triggered on arrival in locations, and navigating and traversing a space finding routes or looking of mixed reality content.
- *Space/Content*: These are mechanics associated with the space and context within which the mixed reality is taking place. Including physics within one reality obeying the physics of another reality such as virtual objects colliding with walls or furniture, occlusion and searching for virtual objects in a physical space, or context awareness such as virtual content changing based on time in physical reality.
- *Transreality*: These are mechanics that directly interface between two realities - virtual content augmenting a physical space, or physical interactions shaping the virtual space. Virtual annotations of real world content, or interacting augmented assets as commonly seen in mixed reality puzzle experiences are here [33], as are skinning interactions that change a physical object to look like a different setting or time period.
- *Social*: While mixed reality games can have a wider range of conventional communication systems here we gather inherently mixed reality options. This includes using the mixed reality as a communication venue by visiting a share virtual space, or using a shared virtual augmentation (such as a virtual white board or even an object everyone can move) to communicate. It also includes hosted reality where through mixed reality users from one physical location may visit a rendering of another.

This survey is far from complete or systematic, but captures the interactions and play seen in conventional locative hypertext such as the work in StoryPlaces [11], locative narrative work [24], mixed reality cultural heritage works [26, 33], and mixed reality games such as Can You See Me Now [3], Pokemon Go[7], and Zombies Run[8].

4 A COMBINED APPROACH

The framework we have laid out here allows us to begin exploring mixed reality and/or locative ludonarrative, as well as giving us the vocabulary to describe this. Intersections of the model in figure 1 and the mechanics in table 1 may lead to MR lodonarrative potential. While an exhaustive exploration of this is beyond the scope of this paper we finish with some selective examples of this approach.

Subversion-Movement: Ludonarrative of this form would seek to use defamiliarization of existing movement mechanics to convey theme or story. As movement mechanics are well established within locative narrative expectations here are easy to exploit. An example

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[7]Niantic, 2016
[8]ZRX, 2014

Movement	Traversal	Moving around a space to change view in both realities
	Navigation	Finding a route to a location in one reality on instruction from another
	Arrival	Triggered content in one reality on arrival in the other
	Locative Choice	Presentation of multiple locative options
Space/Context	Relative Content	Content in one reality that changes based on your relative distance to a location in another reality
	Mixed Physics	Objects in one reality obey the physics of the other
	Augmented Search	Searching a space in one reality for entities from another
	Merged Realities	Using one reality to render and merge together two seperate spaces in another reality.
	Adaptive Augmentation	Altering entities from one reality to fit spatial properties of another
	Contextual Awareness	Altering the content in one reality based on the wider context (time, weather, events) in another
Transreality	Augmented Choice	Presenting decisions in one reality within another reality
	Annotation	Content from one reality presented spatial around an entity from another reality
	Interactive Augmentations	Entities from one reality rendered on another that are interactive
	Positional Augmentations	Entities from one reality rendered within another that can be moved around that reality and respond to their changed position
	Augmented Skin	Using a virtual reality to render new textures for environments and entities within a physical reality
	Time Travel	Using a virtual reality to re-render entities in a physical reality to a different time period
	Capture	Recording elements of one reality (visuals, sounds, notes) within use created content in another reality
Social	Mixed Communication	Users communicate with each other using a mixed reality either as simultaneous visitors in a mixed space or using messages within one reality rendered upon another.
	Hosted Reality	Users visit a virtual rendering of the physical space of another user
	Shared Augmentation	a virtual asset that augments physical reality is shared between multiple users and can be used for communication

Table 1: Mixed Reality Native Mechanics

of this is that typically it is the destination and arrival mechanic that is key in this mechanic not the route or means the player uses to get there and trigger the arrival. A work might seek to subvert this by triggering unexpected content on route to a location or changing the content on arrival based on the detected route taken to get there. A story seeking to explore espionage or stealth tropes that wishes to emphasise considered plans and paths might use this subversion to emphasise those themes. Similarly we might use this to explore a reflectively paranoid character who takes actions but that ruminates on the paths taken and percieved regrets or threats.

Semblance-Space: Locative luconarrative taking this approach would seek to shape a spatial mechanic to the themes of the work. Merged reality as a mechanic might serve a number of metaphors connected with control or territory acquisition dynamics. For example the Dean of Liminal Studies locative narrative presented at ACM Hypertext 2019[9] might have been further expanded with augmented reality content that saw the transdimensional academy manifest in augmented reality artefacts rendered within the real world, these could become more or less prominent within the game space depending on the decisions the player took a visual metaphor of the influence of that world on the player.

Product-Transreality: Ludonarrative using Product-Transreality would deliver its themes and content using the outcomes of transreality mechanics. For example, Bura [6] suggests that mechanics

which start with a high sense of self-mastery (that of a player achieving their own defined goals through skill) but then decreases this mastery can be used to convey the theme of shame. A puzzle game which has the player matching arcane runes to symbols in the real world through perception puzzles could start challenging and rewarding but then deliberately feed the player easy puzzle options to tempt them to taking them and explore the theme of shame in stagnation and lack of ambition. This might also make use of subversion - drawing the attention of the player to the theme by defamiliarising the expectation that games get harder.

Pattern-Social: Pattern ludonarrative games make use of the context of a mechanics delivery such as repetition or structural patterns, ergo a social mechanic exploring this might also use these structures. Consider a mystery game with collaborators in two or more remote locations - isolated labs in the Antarctic or far distant orbital stations - in an adventure game seeking to explore the themes of isolation and loneliness. A mixed reality experience might seek to have them solve a collective mystery for which each player has only half the clues - they can communicate but only in a limited form with a long time delay, perhaps an ancient console interface that takes an extended period to deliver a handful of characters. The careful consideration of how to spend those characters as a resource, the limited communication, the anxiety waiting on a response, and the slow purposeful meter of the interaction would emphasise isolation, and force the player to reflect on the conceptual distance with their collaborator.

5 CONCLUSIONS AND FUTURE WORK

In this workshop position paper we have presented our early approaches to ludonarrative for locative/mixed reality hypertext/games. We establish a new model of luconarrative that brings together the disparate techniques in this space under a new framework focused more on the part of the mechanic that communicates narrative rather than the technique used. We then present an early survey of mixed reality mechanics and show via example how these could be used in conjunction with our model to both deliver locative ludonarrative and offer a vocabulary for its discussion.

As early work there is much future work to explore here. The initial approach requires systemic review to make its reification more robust, this is required for the ludonarrative model but particular the native mixed reality mechanics. A more substantial exploration of the intersection of the model and these mechanics is then required, followed by validation by applying this both in analysis of existing works and the design of new ones. Finally, of particularly relevance to this workshop, the works needs a further ethical consideration and a detailed exploration of how forms of locative ludonarrative might mitigate or exasperate mixed reality ethical issues. Defamiliarising established norms of movement and travel could have safety concerns (there is a risk to subverting safe paths), and exploiting repetition patterns of interaction in delicate locations may increase the impact of those patterns on that space - while beyond the scope of this early work these are issues that demand consideration.

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Correction Note
This paper version has been corrected from the previously published version to correct a typographical error and two citations.

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