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Designing for immersion: The influence of diegetic player guidance on the gaming experience

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Terminology

Apparatus

The apparatus is a “a set of equipment or tools or a machine that is used for a particular purpose”. [I] In relation to video games, it is the device on which the game is played, usually a computer, console or phone.

Cutscene

A cutscene is a scene in a video game which is not interactive; the player cannot influence the events but only watch. They are generally utilized to move the plot forward or to effectively stage particularly dramatic or emotional moments. [IX]

Head-Up Display (HUD)

A head-up display, or HUD, is a transparent display that presents information in the user's viewing direction, allowing them to view information with their head up and looking forward rather than having to look away from their usual viewpoint. In video games, the term HUD refers to the visual mediation of information to the player during gameplay. The HUD is often used to simultaneously display various pieces of information such as the player character's health, items and obstacles. [11, p.1]

Non-Player Character (NPC)

NPC or Non-Player Character refers to all game characters that are not controlled by the players. Traditionally, this includes the majority of characters that populate the game world. NPCs can play very minor to significant roles. [X]

Open World

Open world games allow free movement through the game environment, emphasizing exploration. Typically, they have a non-linear narration that is divided into the main storyline and optional side quests.

Player avatar

The player avatar is the instance controlled by the player throughout the game, allowing them to act in and explore the game world. The term *player character* refers to the avatar as a fictional character within the game's narrative rather than as a player-controlled instance. [11, p.1]

User Interface (UI)

The user interface is “the part of the system that you see, hear and feel” [18, p.4]. Some game design theorists narrow the scope to “the part of the game that allows the user to interact with the game” [12, p.xv], distinguishing between the *physical interface* (input and output devices) and the *virtual interface* (virtual input and output elements). [26, p.223-224]

1. Introduction

In many video games, the player needs to travel from one location to another, interact with objects of the environment and react to various situations in order to progress. However, this is only possible if the player knows how to navigate through and interact with the game world, or else they get overwhelmed and eventually frustrated.

This requires the developers to implement player guidance features that give the player an objective and instruct them on how to achieve it.

There is a plethora of different guidance systems: The player can be led by informing them about their relation to a predetermined goal, enabling them to explore the game world, inspiring or limiting them to execute a specific movement, evoking feelings or providing them with narrative background knowledge.

Despite the differences between these strategies, they can all be categorized into a dichotomy of implementing features into a narrative medium: *diegesis*. This term comprises the fictional world created by the medium which does only represent a part of it, i.e. the narrative world with all its implications.

Accordingly, the player can be guided by cues that exist within it and are therefore *diegetic*: These make sense in the game's setting and could be perceived by the game characters as well. Conversely, features that exist only to the player and go beyond the fictional world are *non-diegetic*. Since each video game is individual and has its own narrative, the scope of the diegesis is different for each one. For instance, the HUD is usually non-diegetic, but there are games that find an in-world explanation for their HUD.

The decision of guiding mechanisms according to the diegetic/non-diegetic design space is made by every game designer. This raises the question of whether these two approaches affect the gaming experience differently and in which situations one is preferable to the other.

In order to answer unravel this correlation, a benchmark of universal relevance and with clear conditions is needed, against which the different approaches can be measured and compared: Immersion, the experience of being so submerged in a form of entertainment that the mediated world "seems as real as, or at least as meaningful as, the real world." [1, p.83] It is considered as one of the highest qualities a medium can create.

Since the method of this paper is rather complex, it is adequate to give a comprehensive overview about the procedure before delving into it:

To establish different approaches of UI design for comparison, the concept diegesis is first defined. This is based on its definition in literature and film since the meaning of diegesis in game studies is derived from these media types. Then, the two appearances of diegesis in games are described: In the user interface, which is the foundation for the evaluation, and in action.

Subsequently, six ways to guide the player are distinguished and categorized into diegetic/non-diegetic UI. The different variants in this design space are the subjects for the comparison.

Then, the multitude of existing definitions of immersion by different game design theorists are conducted and synthesized into one framework of conditions. This is a really valuable work since there is a plethora of papers on immersion but only a few papers dare to condense them into one concept. This benchmark can be used to evaluate all game design choices. It is also explored which experience dimensions of immersion are actually influenced by player guidance.

Finally, the established system comes to the test by analyzing two characteristic examples of player guiding: interaction with objects and orientation. Their diegetic/non-diegetic UI design space is explored and compared with the prerequisites of immersion. The results are synthesized for the respective dimension of player guidance.

In conclusion, the results of the theoretical and practical studies are brought together, leading to a derivation of common findings from which overarching recommendations for player guidance can be conducted.

This research is highly relevant since, although there are plenty studies of immersion, diegesis and also their correlation, they are rarely brought together under the aspect of player guidance. But this is very important because leading has proven to be one of the most important aspects of game design. The findings of this study can be used to improve existing games and develop new ones and if applied, they will lead to more immersive and therefore more enjoyable gaming experiences.

2. Diegesis

In video games, the term "diegesis" comprises the narrative world. Therefore, characters, objects and actions that exist within it are "diegetic", and those that go beyond it are labeled "non-diegetic". This concept did not originate in game studies but was established by the film analysts Anne and Étienne Souriau who used the French term "diégèse" to refer to the narrative world.

However, there is another concept of diegesis which goes back to the ancient Greek philosopher Plato. He made a distinction in literal narration, classifying whether it involves imitation or not.

Although Plato's definition does not directly apply to video games since they are a representational and not a descriptive medium, his concept is crucial for understanding the true meaning of "diegetic."

2.1 Diegesis in literature

In Plato's dialogue *Republic*¹, he distinguishes two forms of diêgêsis/διήγησις, which is simply the ancient Greek word for narration. The character Socrates states:

"[When using direct speech] poetry is discovered to be an imitation thrice removed from the truth, and Homer, as well as the dramatic poets, having been condemned as an imitator." [VII, p. 7]

"Or, if the poet everywhere appears and never conceals himself, then again the imitation is dropped, and his poetry becomes simple narration." [VII, p. 248]

Plato differentiates two forms of diêgêsis: The narration through imitation/mimesis [direct speech] and the narration without imitation/mimesis [indirect speech], as Anton Fuxjäger clarifies. [13, p.20] When there is no mimesis, "the poet himself is the speaker, and does not even attempt so suggest to us that anyone but himself is speaking." [20, p.106] Conversely, the poet can try to "create the illusion that it is not he who speaks" through dialogue or monologue. [20, p.106]

This distinction is now often reduced to the conceptual opposition of 'mimesis vs. diegesis' [12, p.19-20] which is contrary to Plato's initial conception of diêgêsis as a generic term: "narration [diêgêsis] may be either simple narration, or imitation, or a union of the two" [VII, p. 247] In the sense of the new distortive simplification of his distinction, diegesis now means "narration without imitation." [13, p.20]

2.2 Diegesis in film

The concept of diégèse, on the other hand, was introduced by the film analyst Anne Souriau in 1950. [27, 581] One year later, her father, Étienne Souriau, presented it to the academic public in a lecture. [28, p.140] He uses this term to encompass everything that happens according to the fiction presented by the film and what it implied when considered as true. [28, p.156] In other words: The diégèse is the universe of the work, the world created by a work of art that represents only a part of it. [27, p.581]

Fuxjäger clarifies this from a practical standpoint: The recipient has to *complete* the relatively little presented information in order form a coherent idea of the fictional world. [13, p. 18]

This concerns room: A city has more streets than those described; houses in these streets are not limited to their portrayed facades; a character did not magically teleport from A to B because the narrative did not depict how they got to B; [13, p.18] time: The scenes, only a few minutes apart, in which a character appears first as a child and then as an adult, imply a diegetic time jump of about fifteen years; [28, p.156] and action: since the character has now a scar, they must have sustained a corresponding injury when it was not depicted; as a character is now at location B, they must have gotten there somehow. [13, p.18] This means that to understand the narrative, the recipient has to form a more or less detailed and coherent spatiotemporal understanding of the narrated world. [3, p.18]

In the Sourian sense, the term 'diegetic' means everything belonging to the diégèse; [28, p.151] and although there is no negated form in his text, this distinction is made in today's film analysis:

On the one hand, the moving images of character's actions, locations and the acoustic reproduction of dialogues, noises and sounds performed in the narrated world are considered diegetic. On the other hand, written inserts that provide information about location and/or time of action, the voice over of an 'omniscient' narrator, credits, scratches on the film copy or a microphone held too low during recording are non-diegetic. [13, pp.24-25]

"Diegetic ... refers to something the characters in the film could perceive, whereas nondiegetic refers to something they could not." [VIII]

¹ The *Republic* is Plato's most famous and widely read dialogue. It explores two central questions: "What is justice?" and "What is the relation of justice to happiness?" [III]

2.3 The true meaning of “diegetic”

However, everything the film conveys is actually *non-diegetic*, since the film itself is outside the narrated world (with documentaries as an exception) and since the recipient perceives only through the film, they do neither hear nor see any actual part of the narrated world. The *diégèse* exists only in their imagination; the film just conveys signs that refer to the *diégèse* and prompt the viewer to construct the idea. Thus, the term ‘diegetic’ is inadmissible. [13, p.26]

In order to understand what it is actually based on, it is necessary to refer back to Plato's differentiation between narration through imitation/mimesis and without imitation/mimesis.

As Fuxjäger puts it, the ‘diegetic’ elements are *imitations* of things and events that exist in the narrative world or are said to have occurred there. They inform about the *diégèse* with a great similarity between their representation the actual form in the narrated world. [13, p.27] E.g., moving images of events, playback of dialogue or ‘diegetic music’ tell in a mimetic matter. [13, p.28]

Conversely, ‘non-diegetic’ elements inform the viewer without imitating the *diégèse*. [13, p.27] E.g., superimposed titles, voices of noncharacter narrators or background music are non-mimetic. [13, p.29]

Despite this imprecision in the terms, they are now well-established and attempting to alter them would be futile. Therefore, in the subsequent work, the more accurate terms ‘mimetic’ and ‘non-mimetic’ will not be used, but rather ‘diegetic’ and ‘non-diegetic’.

2.4 Diegesis in video games

Fuxjäger points out that, although Souriau only refers to film, the concept of *diégèse* can be applied to all types of narratives, regardless of the medium in which they are conveyed. [13, pp.21-22] Consequently, the examination can now be extended to video games. Two models are presented, one of which concerning the audiovisual presentation and the other the interactivity of the medium – the interplay of player and game.

2.4.1 Diegesis in the user interface

In the book *Half-Real*, video game researcher Jesper Juul differentiates two major elements that build a game: rules and fiction. Objective and unambiguous rules describe what players can and cannot do, and what the response to certain player

actions is. The author refers to them as a *state machine*: in a certain state the player can act in a number of different ways state, resulting in another game state”. When a player tries to overcome challenges to reach an as positive as possible outcome, gameplay emerges. [16, pp.55-56]

Fiction describes the narrative world presented by the game and imagined by the player [*diégèse*]. It is conveyed using graphics, sound and text but also externally by advertising, the manual *and* the game rules – “though rules can function independent of fiction, fiction depends on rules”. [16, p.121]

Rules and fiction rarely align completely, yet space is a special case: “The level design of a game world can present a fictional world and determine what players can and cannot do at the same time,” space in games is where fiction and rules overlap. [16, p.163]

Erik Fagerholt and Magnus Lorentzon explore the relationship of fiction, rules and space further by illustrating the design space.

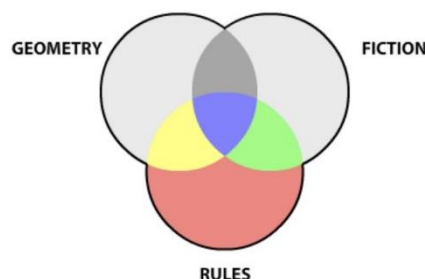


Figure 1 Fagerholt and Lorentzon's design space model based on Juul's *Half-Real* [11, p.50]

Based on this, Fagerholt and Lorentzon establish their own model which takes specifically the UI-related design space into account. They distinguish six variants, one of which being a subgroup of another.

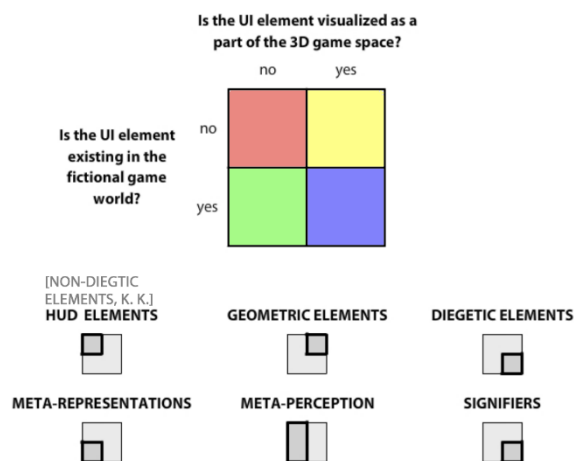


Figure 2 Fagerholt and Lorentzon's design space model for UI elements [11, p.51] [colors added]

NON-DIEGETIC ELEMENTS are visual UI elements that are neither part of the game's narrative nor of the game's space. They are presented in an overlay manner. [11, p.51]



Figure 3 HUD-elements displaying health, time, items, controls, minimap, tracked quest etc. in *The Witcher 3: Wild Hunt* [H]

META-PERCEPTION elements are outside of the game space and aim to draw the user into the reality of the game by visualizing one's in-game internal status in a way "reminiscent of some kind of perception". In most cases, meta-perception is not connected to the game fiction since using an abstract visualization, but some games prove that the fictional world can be used.

Meta-perception is not restricted to visuals; e.g., a heartbeat audio or pulsating controller can inform the player of a critical level of health. [11, p.52]

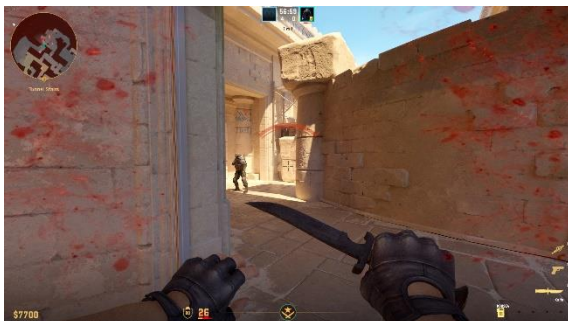


Figure 4 Blood splatter meta-representation that indicates damage in *Counter-Strike: Global Offensive* [V]

META-REPRESENTATIONS are "information carrying entities within the fictional game world but outside of the game space." [11, p.52]



Figure 5 HUD-elements that are displayed as if on the player character's helmet in *Metroid Prime* [R]

GEOMETRIC [SPATIAL] ELEMENTS are UI elements that exist in the game space without being an entity of the fictional world. [11, p.52]



Figure 6 Spatial enemy health indicator in *The Witcher*: [F]

DIEGETIC ELEMENTS are UI elements that are both part of the spatial and the fictional game world, "entities that exist in the game world, and are presented as they were viewed by the player character." [11, p.52]



Figure 7 Mobile phone used to identify animals in *Alba: A Wildlife Adventure* [T]

SIGNIFIERS are a sub-group of diegetic elements that do not convey information in a direct manner like normal diegetic UI elements but "provide the player with subtle informational cues for the player to interpret by logical reasoning." Put simply, signifiers carry information, but not about themselves. [11, p.52]



Figure 8 Flowing runes from the scarf into the game world indicate the loss of flying power in *Journey* [S]

2.4.2 Diegesis in action

Alexander R. Galloway applies the concept of *diégèse* to the nonlinear nature of digital games by creating a model for the relation of action and diegesis, distinguishing between operator acts (relate to the player) and machine acts (relate to the game).

DIEGETIC OPERATOR ACTS are actions from the player within the story world using input devices. They appear as either *move acts* or *expressive acts* (two categories that are more variations on a theme than mutually exclusive). Move acts change the physical position or orientation of the game environment, whether by navigating the player character through the game world or changing the viewing direction. Expressive acts are all interactions with the game environment such as pick, open, talk, use etc. It is about the relation of the “acting agent (the player character) and an actionable object.” [14, pp.22,24]

NON-DIEGETIC OPERATOR ACTS are actions of configuring the software. Galloway points out two basic variants: There is the area of *setup* which consists of “interstitial acts of preference setting, game configuration, meta-analysis of gameplay, loading or saving, selecting one player or two”, pushing pause or using cheats. The other variant are gamic actions where the *configuration* is integrated into the gameplay. This happens in an informative layer beyond the narrative world such as menus. [14, pp.12-14]

DIEGETIC MACHINE ACTS are *ambience* acts, perceptual happenings that the game is still under way, even as no gameplay is happening at the moment. “The game is still present, but play is absent.” An example are non-playable characters that walk from screen to screen and continue functioning when out of sight.² *Cutscenes* fall also into this category “but instead of being in a perpetual state of no action, the cinematic elements in a game are highly instrumental and deliberate, often carrying the burden of character development or moving the plot along in ways unattainable in normal gameplay.” During a cutscene, the player is not only passive but irrelevant for the progression of the narrative. [14, pp.10-11]

NON-DIEGETIC MACHINE ACTS are “integral to the entire experience of the game but not contained within a narrow conception of the world of gameplay”. They include internal forces like power-ups, goals, high-score stats, dynamic difficulty adjustment, “game over”, the HUD etc. but

also external forces such as software crashes, low polygon-counts, temporary freezes etc. Galloway says “narrow conception” since “many nondiegetic machine acts such as power-ups or health packs are in fact incorporated directly into the narrative of necessities in the game such that the line between what is diegetic and what is nondiegetic becomes quite indistinct.” [14, p.28]

The author differentiates three non-diegetic machine acts. The *disabling acts* are the most irritating for the player since they disable the games logic from the outside world; it includes crashes, low polygon counts, bugs, slowdowns, temporary freezes, and network lag. [14, p.29] *Enabling acts* are “any number of actions offered by the machine that enrich the gameplay rather than degrade it”; a piece of information, increased speed, an extra life, points etc. grant something to the operator. The player can *use* these elements. Although enabling acts stand in contrast to the *diégèse* can they be seamlessly integrated into it by masking them into diegetic elements. [14, pp.30-31]

Beyond disabling and enabling acts, Galloway also refers *machinic embodiments* of logic that goes beyond the game world. For example, the colors of Mario in the NES version of *Super Mario Bros* are not determined simply by artistic intention or narrative logic but by the 8-bit 6502 microchip driving the game software which can only display a certain number of colors at a time. Another example is the different flow of arcade games and home computer or console games. Since arcade games rely on the insertion of money, they need to be quantifiable. This is why they are structured around the concept of lives, where a single quarter provides the player with a fixed number of lives. In contrast, home computer games, which are typically one-time purchases or free-to-play, offer a more fluid continuum of gameplay and are often designed around health. [14, p.32-33]

Conclusively, Galloway emphasizes that these principles should not be considered as fixed “rules” for video games but instead as tendencies which he observed through the examination of specific games. “These are not ideal types; they are, rather, provisional observations that spring from an analysis of the material specificities of the medium.” [14, p.38] Nevertheless, his principles form a robust framework from which the diegesis in video games can be systematically analyzed.

² The first engine allowing this was *Virtual Theatre* by Revolution Software, initially proposed in 1989 [V]

3. Player guidance

“The main objective of a game designer is to create a specific kind of experience: *gameplay*.” [14, p.1] This is the interaction between the player and the game world, system or rules. [22, p.xx] In Galloway’s terms: the *operator acts* on the *state machine*. Prerequisite for gameplay is intentional behavior: “goal directed actions.” [15, p.11] To achieve this, the game has to lead the player towards a goal using guidance systems. This is especially important in open world games since they are non-linear. [21, p.169]

But designing a guidance system is a tightrope walk. As Francine Rotzetter argues, the player can become bored by overly obvious clues which annihilate the exploration of an open world, but if the guidance mechanisms fail, the player is left behind confused and disoriented, causing the virtual reality to lose its credibility and atmosphere. [21, p.172]

This raises the question of how player guidance elements should be best implemented in a game. To be able to answer this, it is necessary to take the design space into account.

3.1 Six guidance systems

In her article *Nonverbal Guidance Systems. Seamless Playerleading in Open-world Games*, Rozetter posits that the ideal guidance system is suggestively communicated by “a large number of different verbal and nonverbal clues, which together form the guidance systems.” [21, p.170] Those clues are different from other objects or circumstances in the game so that the player’s attention is attracted, and sometimes prompting a completely intuitive reaction. [21, p.172]

The author classifies six approaches on player leading in open world games based on their design, perceptual channel (visual or auditory) and effect on a player. [21, p.170]

The INFORMATIVE GUIDANCE SYSTEM informs the player about “their own position in relation to a predetermined goal [and] the properties of a specific goal”. The player usually has to initially learn how to use and interpret these systems, then they are easily available and very informative. Therefore, Rozetter argues that “a good balance must be found so that the player remains challenged, but not overwhelmed”. Examples are *maps, minimaps, symbols, near or far and right or wrong*. [21, p.173]

The INTERACTIVE GUIDANCE SYSTEM guides the player “by [non-linear] interactions with or properties of the nearby environment,” using the player’s curiosity and their motivation; the player thinks that they are deciding their own way. This system relies on motivation and fails if the clues are overlooked. It includes *motivation based decisions (menace/temptation [lure], ways and signposts) and interpersonal interactions (non-player character gesture, chase/run after)* [21, p.175]

The PROCESSUAL GUIDANCE SYSTEM is part of the interactive guidance system. It relies on “autonomous linear movements in the environment that the player cannot influence”. They make invisible motion visible. [21, p.176] Rozetter posits that visual cues are always preferred to auditory cues due to *visual dominance*.³



Figure 9 The direction is given by a visible wind current in *The Legend of Zelda: Breath of the Wild* [Q]

The SPATIAL GUIDANCE SYSTEM guides the players through limiting their freedom of movement, inspiring them to execute a specific action or creating a point of orientation. It uses static objects to guide the player in three ways:

points of orientation have a high auditory or visual contrast to the environment which they divide into segments. “The greater the contrast, the greater the absolute meaning of a point of orientation, and the smaller the subjective interpretation.”

Architectonic elements (doors, walls, corridors, stairs) limit the player’s freedom of movement or sight without troubling them. They may inspire the player to a specific action or give hidden clues. *Natural obstacles* are parts of the natural environment limiting the movement. Rozetter states that those natural borders should have an appropriate dimension. [21, pp.177-179]

³ The tendency for visual information to determine what is perceived when there is a conflict between the visual information and information from another sensory modality [VI]

The player will not accept a river that is one foot wide as a barrier. On the other hand, a wide, heavily flooded river will be accepted as a barrier without generating any confusion. And locked doors are also not so easily accepted by players. By playing a short sound sequence of a door locking, this problem can be easily solved. [21, p.177]

The EMOTIONAL GUIDANCE SYSTEM amplifies other guidance systems and *can* evoke feelings in players that can influence their movements. The author argues that it can easily fail due to its subjectivity, but if successful, it results in an extraordinary immersion gain. Elements of this leading strategy are *atmosphere, light, music, sounds, camera and environment*.

Atmosphere depends on different sensory perceptions such as light, music and weather.

Light can communicate different things by the combination of “brightness, color, angle of incidence and duration” with the meaning changing completely by altering only one of these aspects. As light can empathize but also hide things through its absence, it steers the player’s attention. [21, p.179] Although Rotzetter does not mention it explicitly, *color* can be used in a similar manner. For instance, the complementary color of the dominant color of a level naturally stands out from the rest. [2, p.13] Furthermore, *movement* can also guide the player, as moving objects naturally stand out in a still environment. [11, p.81] *Music* cannot communicate direction but influence the player’s movements. For instance, battle music indicates that enemies are near and the player will react accordingly. When it stops, the situation is saved again.

Sounds communicate more specific information. They can be *abstract* (right or wrong, part of the *informative guidance system*), cultural (provide information about culture and time) or *natural* (natural phenomena, avatars body [e.g., out of breath may indicate low stamina], footsteps may indicate the ground)

Camera and environment limit the player’s actions in some way, e.g. through a fixed camera angle that always shows where you have to go [this is about the *composition* of the space into subject, background and foreground [2, p.19]] or mist which complicates perception. [21, p.180]



Figure 10 Empathization with different levels of light in Kentucky Road Zero [E]

The NARRATIVE GUIDANCE SYSTEM guides the player “by specific circumstances that they are able to understand only if they know the narrative background of the respective system.” This narrative background was previously presented to the player in speech or written form, now they are able to extend the story from a specific point to the whole world. Thus, the open-world gains substance.

Places with history “link together different places in the game and reveal a greater meaning”. For instance, ruins in a specific architectural style have a narrative connection. Points of orientation can be created by suggesting certain circumstances that help the player understand the importance of a place so that they can recognize it later. *Characteristics*, on the other hand, are clues that allow the player to deduce something. “Smoke may indicate fire”. To understand all the parts and solve the riddle, the player may need subtle hints, otherwise they may become frustrated. [21, pp.181-182]

At the end of the article, Rotzetter clarifies that “there is no guarantee that a guidance system works because it always depends on interpretable game aspects.” But a combination of the six approaches and the deliberate use of their different abilities reduces the risk of failure and may “improve immersion and atmosphere considerably”. [21, pp.187-188]

3.2 UI design space of guidance systems

Since the objective of this term paper is to delineate between diegetic and non-diegetic (and the variants in between) player guidance, it is necessary to explore which approaches require this distinction to be made in the first place. For this purpose, Fagerholt and Lorentzon's model is utilized, into which Rotzetter's six variants are categorized.

Since the *narrative guidance system* is established by the narrative, it can only refer to elements within the diégèse. Furthermore, Rotzetter states that the player can apply the gained knowledge throughout the open world. Therefore, the clues also have to be visualized in the game's spatial field. Thus, this guidance system is in all cases diegetic.

However, there is a special case of the *narrative guidance system* that was not described by Rotzetter: The narrative can break the *fourth wall* by having a character or narrator refer to a realm outside the diégèse, the player's. This can trigger a *non-diegetic operator act*, for instance on the player's apparatus.

A game which does this is *One Shot* [L]: A NPC and even the game itself acknowledge the player's existence outside of the game world. In the computer's file system, the player solves puzzles and uncovers clues.

But since this breaking of the *fourth wall* is highly unconventional, it will not be further addressed.

The *emotional guidance system* must be analyzed according to its components:

Light, color and movement are always visualized within the spatial field. They can be reasoned within the game world thus making them diegetic, otherwise they are purely spatial.

Since *music* and *sounds* are not part of the visual user interface, they can only be either diegetic if they originate from the game world, or non-diegetic if they are just generated by the apparatus. *Camera* does not mean an actual camera but the camera angle, the framing of the world. Since this is not actually represented but rather implied, is not inside the diegetic-non-diegetic-spectrum.

The *environment* is the game space and also part of the diégèse, since Anja Kühn argues that the spatial construction of the game world is the construction of the diegetic world. [17, p.54] Therefore, it is always diegetic.

Atmosphere is created through the combination of the other clues within the *emotional guidance system*. Therefore, whether the atmosphere is diegetic or not depends on them.

The *spatial guidance system* is per definitionem within the game space. Furthermore, the points of orientation, architectonic elements and natural obstacles are in most cases within the diégèse. However, there are rare instances where just spatial elements limit the player's freedom of movement, for example by an invisible wall.

The *processual guidance system* uses spatial cues as well. These are usually integrated into the fictional world which makes them diegetic, but it is also possible to have them just as spatial components.

As the *interactive guidance system* relies on cues in the environment, it is always part of the game space. And since the player is indirectly guided by hints within the diégèse such as pathways and NPCs, this guidance system is always diegetic.

The *informative guiding system* is the most versatile, as it can inform the player about "their own position in relation to a predetermined goal [and] the properties of a specific goal" [21, p.173] in various ways: Within the spatial field or in an overlay manner, within the fictional world or only to the player. Thus, this approach encompasses all four possibilities within the design space.

As the previous analysis shows, player guidance features can be implemented into the UI in a multitude of ways:

guidance system	In the game space	Not in the game space	In the fictional world	Not in the fictional world	
informative	X	X	X	X	diegetic/non-diegetic/meta/spatial
interactive	X		X		diegetic
processual	X		X	X	diegetic/spatial
spatial	X		X	X	diegetic/spatial
emotional					
light	X		X	X	diegetic/spatial
color	X		X	X	diegetic/spatial
movement	X		X	X	diegetic/spatial
music			X	X	diegetic/non-diegetic
sounds			X	X	diegetic/non-diegetic
camera					
environment	X		X		diegetic
narrative	X	(X)	X	(X)	diegetic (/non-diegetic)

Figure 11 The design space in relation to the diégèse

However, this is not the only design space in the conception of player leading strategies. The guidance systems can also be combined in multiple ways.

With this plethora of different player guiding strategies, the question arises as to which should be chosen in which situation. A benchmark of universal relevance and with clear conditions is needed, against which the approaches can be measured and compared. Immersion.

4. Immersion

The term immersion originates from the Latin word *immergere* which means “to dip or plunge into,” referring on the complete submersion of an object in liquid. [17, p.53] But in recent media studies, it is mainly used to describe the mental immersion in virtual worlds. As presented in Ernest Adam’s *Fundamentals of Game Design*, immersion means that the recipient is so submerged in a form of entertainment that they are unaware that they are experiencing an artificial world. The mediated world “seems as real as, or at least as meaningful as, the real world” so that they become detached from the outside world. [1, p.38]

However, exploring immersive player guidance cannot rely solely on this definition as it does not include the conditions of immersion. For this, a robust framework is necessary. Yet, this is where immersion becomes ambiguous because many video game theorists have established their own models and concepts of immersion. As Patrick M. Brown points out, “researching immersion [is] a rather diluted process”. [5, p.6] Therefore, this plethora of divergent approaches has to be organized by combining or distinguishing them. This synthesis will serve as a definition of immersion and a foundation for the discussion of player guidance mechanisms.

4.1 Levels

In their article *A Grounded Investigation of Game Immersion*, Emily Brown and Paul Cairns describe the road to an immersive gaming experience as a three-step process.

Their first level is *engagement* which means that the player is “interested in the game and wants to keep playing”. To engage with the game, the player has to like the game’s style and is willing to invest time, effort and attention. Therefore, the game has to reward the player for their effort and provide something worth attending to. The game has needs also to be accessible, controls and feedback have to correspond. [5, pp.1298-1299]

For the player to reach *engrossment*, the game has to directly affect their emotions through visuals, plot or interesting tasks. This creates a “high level of emotional investment in the game” so that people want to continue playing and the game is the most important part in their attention. Thus, they are less aware of their surrounding and less self-aware. [5, p.1299]

Total immersion is the fleeting experience of *presence*, being completely detached from reality as only the game matters. It is the only impact on the thoughts and feelings of the player. The authors name two barriers: *Empathy* occurs when the player can empathize with game characters. *Atmosphere* on the other hand means that the player has to use their own senses to interpret the game world much as in real life, forcing the player to commit (nearly) all attention to both visual and auditory cues. [5, p.1299]

However, Brown and Cairn’s model is no universal ruleset. For example, Dominic Arsenault points out that empathy is not necessarily a prerequisite of total immersion, arguing that one can experience it also in games with an absence of plot and characters. [3, p.2] In order to establish a consensus, the various definitions of immersion are now compiled.

4.2 Dimensions

To begin with, all dimensions of immersion can be categorized under a dichotomy which was developed by Laurie N. Taylor in 2002. [29, pp.12-14] She argued that there are two types of immersion:

In *diegetic immersion*, “the player is immersed in the act of playing the video game”, similarly to reading a book or watching a film. They do not attend to the spatial field and accept it as a given, natural domain of experience, it fades into the background. This is why “the player is able to partially forget his or her independent existence” Taylor calls this “acting upon the game.”

Contrarily, in *intra-diegetic immersion*, “the player is immersed in playing the game and in the experience of the game as a spatial and narrated space.” This is exclusive to video games as they allow the player to actively navigate through the game world which enables them to pay attention to the experience of space: “The character’s involvement with the space becomes the player’s involvement with the space”, they feel like they are actually part of the diegetic space. This time, the player is acting “within the game space.”⁴

Based on this division, the various experience dimensions of immersion can be distinguished into those that apply to every form of media and those that are exclusive to video games. However, since Taylor points out that *intra-diegetic immersion* can only occur, if the player is already *diegetically immersed* into the game [29, pp.14], all dimensions will be discussed.

⁴Alison McMahan established a similar concept, distinguishing between immersion on a *diegetic level* and on a *nondiegetic level*. [18]

4.2.1 A mental response

The initial requirement for every form of immersion is the “willing suspension of disbelief” as described by the English poet Samuel Taylor Coleridge in 1817. [8, p.208] And although Coleridge was originally referring to the “poetic faith”, an absence of skepticism towards the poem’s romantic, imaginary people, the term *suspension of disbelief* is now used in the gaming industry to denote immersion. [1, p.38]

Anja Kühn calls this “willingness of the recipient to temporarily accept the world that the medium conveys to them as a reference instance for their own behavior” MENTAL IMMERSION. The fiction is treated as a model of reality, as if it were real. [17, p.53] Kühn empathizes also the importance of *involvement*. This term indicates the degree of subjectively perceived importance of a behavior. [IV] An involved user focuses their “energy and attention on a coherent set of stimuli or meaningfully related activities and events.” [30, p.227] Kühn argues that this commitment of *involvement* is necessary to reach the state of being affectively, cognitively and interactively connected to the game character and storyline.⁵ [17, p.59]

4.2.2 A perceptual response

Another prerequisite for *diegetic immersion* is the audiovisual presentation of the video game. Laura Ermi and Frans Mäyrä describe SENSORY IMMERSION as when “the player becomes entirely focused on the game world and its stimuli”. For this to occur, large screens and powerful sounds have to overpower the sensory information from the real world. [10, p.7] Alison McMahan refers with PERCEPTUAL IMMERSION to the same concept: Through blocking as many sensorial cues from the outside world as possible, the user perceives only the game world. [19, p.77]

4.2.3 A response to narratives

The feeling of mental absorption into a game’s world and stories, or empathizing with its characters, also falls under *diegetic immersion* and has been labeled in various ways.

Ermi and Mäyrä refer to it as IMAGINATIVE IMMERSION and empathize that “this is the area in which the game offers the player a chance to use her imagination” [10, p.8] However, Dominic Arsenault argues that attributing the use of one’s imagination as a characteristic of IMAGINATIVE IMMERSION makes it vague and all-inclusive “since we are constantly evaluating things and situations according to

mental schemas”; the consumption of media is never completely passive as recipients constantly map mental schemas and building sense on what is presented to them.

Therefore, Arsenault pleads that this dimension should be named FICTIONAL IMMERSION, asserting that “Ermi and Mäyrä’s definition ... implicitly relies on the concept of fictionality”, with the use of imagination being just one aspect among others. [3, p.1] His model relies on the illusionist conception of realism that Marie-Laure Ryan presents: that “there is more to this [fictional, represented] world than what the text displays of it: a backside to objects, a mind to characters, and time and space extending beyond the display.” [233, p.158] [Thus, Ryan describes the concept of the *diégèse*.] With this limitation, Arsenault excludes the broad scope of IMAGINATIVE IMMERSION but still includes all forms of storytelling in games, such as narration and representation. [3, p.2]

Ryan describes three additional variants of this NARRATIVE IMMERSION: *temporal*, *emotional* and *spatial* [the latter will be addressed later].

Temporal immersion means the “burning desire to know what will happen next” and includes curiosity, surprise and suspense. For instance, a player exploring a game world is driven by curiosity. *Emotional immersion* occurs with “affective reactions to the story and to the characters”, as these lead to “excitement, triumph, dejection, relief, frustration, relaxation, curiosity, and amusement”. These emotions are overwhelmingly self-directed as they reflect the player’s success and interest in playing the game. Ryan argues that the game has to limit the player’s agency in order to create emotions towards game characters. [24, pp. 8, 9, 11]

This empathization with game characters is heavily empathized by Anja Kühn. She argues that the player transforms the game world into an empathic field and, during the course of reception, creates a social microsystem of complementary empathic roles. [17, p. 55] This arises from the narrative and by the constellation of individuals [31, p.109] and is likely to significantly contribute to the impression of immersion. [17, p.55]

Furthermore, Ryan formulates two *intra-diegetic* goals of interactive storytelling: The user should be integrated in the story, ensuring that all actions relate to the plot and move it forward. Consequently, the story should be dynamically created, “as much as possible in the real-time of the user’s interaction with the system.” [24, p.8].

⁵ Kühn adds that *mental immersion* is not exclusive to narrative and/or spatial experiences, e.g., a concert or the radio. [17, p.54]

4.2.4 A response to challenges

Another form of immersion relies also on the interactivity of the medium and, therefore, pertains to *intra-diegetic immersion*.

Ryan describes LUDIC IMMERSION as the “deep absorption in the performance of a task.” [24, p.8] Ermi and Mäyrä’s CHALLENGE BASED IMMERSION means the satisfying balance between motor and/or mental skills and the challenge. [10, p.7]

Ernest Adams further subdivides into TACTICAL IMMERSION, characterized by the sense of being “in the grove” where fast paced action leaves no brain capacity for anything else, and STRATEGIC IMMERSION, experienced when the player is engaged in the intriguing gameplay loop of optimizing choices through observing, calculating and planning to win a game. [1, p.38]

All three definitions can be associated with Mihaly Csikszentmihalyi’s concept of an *optimal experience* which tends to occur when “we are focused on realistic goals with our skills matching the opportunities for action.” This *flow* experience is an end in itself and it brings not only a sense of exhilaration but also lets us temporarily forget other things [which makes it immersive].

The author lists seven major components of the *optimal experience*: “tasks with a reasonable chance of completion, clear goals, immediate feedback, deep but effortless involvement that removes from awareness the frustrations and worries of everyday life, sense of control over our actions, no concern for the self, and alteration of the concept of time, hours can pass in minutes and minutes can look like hours” [9, p.1]

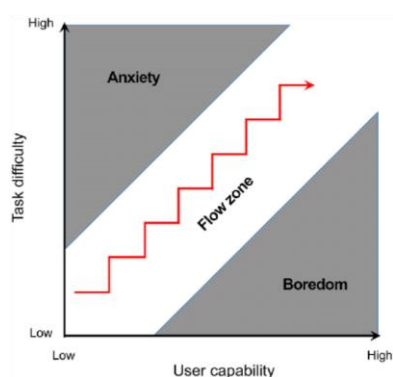


Figure 12 The concept of flow

However, Taylor argues that the player first has to be able to overcome the problem of the interface in order to interact with the game “without having to constantly take notice of and account for the method of interaction.” [29, pp.14-15] On a similar note, Brown and Cairns empathize that *engagement* is not possible if there are usability and control problems. Essentially, there needs to be an invisibility of controls.” [5, p.1300]

Furthermore, Kühn points out that, for the player to realize the potential of interactivity, they have to experience their own effectiveness and the changeability of the game world. Through the recurring interplay of actions and feedback, of player and game, a quality of immersion is created which Kühn refers to as SYSTEMIC IMMERSION. [17, p.57]

Kühn also specifies two levels of interactivity: The starting point is the recursive sensorimotor feedback of medium and user, from which a new quality of SYSTEMIC immersion can emerge: the *behavioral mode of play* – the user not only adapts to the technical equipment (display, input devices, etc.) but also accepts the game rules and disregards all rules, norms and conventions that contradict them. [17, p.58]

Arsenault’s definition of SYSTEMIC IMMERSION aligns precisely with that concept: “a system (of rules, laws, etc.) governing the mediated object replaces the system governing a similar facet of unmediated reality.” For that, he provides a characteristic example:

“To think about the player’s avatar’s chances of survival in a typical RPG in terms of Hit Points, Attack values and such rather than torso and arm size, weight of the weapon, etc., is to adopt the game’s system and reject the laws of real-world physics (unless, of course, the game system does take into account the arm size and weight of the weapon rather than Hit Points and Attack values, in which case the reasoning is reversed).” [3, p.2]

Thus, Arsenault refers to a mental state rather than an actual interaction with the medium, explicitly contradicting Ermi and Mäyrä’s CHALLENGE BASED IMMERSION. He argues that “one can be immersed in a system without necessarily being challenged by it”. As an example, he references a whodunit TV show, where the viewer constantly forms hypotheses and endeavors to interpret the clues in order to find the culprit before the show reveals it. This illustrates that one can experience a form of challenge also in a non-participatory media. [3, p.2] Therefore, Arsenault’s concept falls into *diegetic immersion*.

4.2.5 A response to space

The final dimension of immersion is what Adams and Kühn denote as SPATIAL IMMERSION. Adams means that the user feels like being in a different place than they are actually in. [1, p.39]

Kühn describes this as drawing the recipient into the scenography, the dividing line between image space and real space is demarcated. This can be achieved through subjective perspectives on the events, virtual zooms and movements into the depths of the image. [17, p.56] As Laura Bieger points out: "By involving us into their range of experiences, [the spaces] reach not only into the space that confines them, but also into us, becoming spaces of our imagination."⁶ [4, p.10]

Since SPATIAL IMMERSION is *intra-diegetic*, the player has to be able to act *within* the game space. Kühn states two prerequisites: the game has to be *dynamic* (the game characters can move) and *plastic* (the movements of the player character influence the perspective modification of spatial coordinates and views). [17, p.56]

On a similar note states Ryan that the "sense of place and pleasure taken in exploring the story-world" is possible because games simulate "movement as an embodied experience" by "adapt[ing] the display to the position of the player's virtual body" [24, pp.8-9]

Thus the game space exists not only as representational, but also as experiential, the narrative and the character exist within the same space. [29, 15]

This aligns with the concept of *presence* which Ermi and Mäyrä define as a "psychological experience of non-mediation, i.e. the sense of being in a world generated by the computer instead of just using a computer." [10, p.4]

In a talk at the Game Developers Conference 2016, Thomas Grip establishes five rules to achieve *presence*: 1. constant input [which is basically the recurring interplay of player and game as described by Kühn], 2. agreeable action outcome: the player should agree to actions that the player character performs autonomously, 3. deterministic mechanics, one should know what will happen if they initiate an action (the player can look at the environment and picture of how all elements work, the fantasy is kept alive), 4. minimal repetition of game elements as they make the player feel the "fakeness" of the world and 5. consistency: "if you do something with a type of

object in one place you should be able to do that with the same type of object at another place". [II] Rules 2, 3 and 5 revolve around the mental picture of the world that the player constructs in their mind. As they play, expectations are formed. If they align with the conventions of the game, the player can feel *present*. Conversely, this means that a break with expectations results in a break with immersion.

Fagerholt and Lorentzon refer to the consistency as *immersion through reasoning* since it "enables the player to reside in a fictional frame rather than a rule-oriented frame whilst playing." [11, p.69] Taylor also empathizes the "consistency of the constructed game space within the confines of the game space". This includes coherence among all game design choices: engines, programming, interface, visual/aesthetic choices and the game world boundaries set forth in narrative and theme.

In conclusion, it must be emphasized that "immersion is not a property of a game or media text but is an effect that a text produces.", as Elena Gorfinkel puts it. [25, p.425] This implies that a media object does not need to be immersive all the times and to everyone to qualify as such. [3, p.3] Ermi and Mäyrä call it a "multi-faceted phenomenon" and argue that it is a matter of degrees depending on the individual cases of games and players. [10, p.7] As Brown and Cairns point out, some players might not even engage with a game in the first place. [5, pp.1298-1999] It is also important to note that the dimensions of immersion are a synergy, reinforcing each other. [17, p.54]

Hence, not all aspects of immersion have to be perfectly fulfilled to achieve an immersive experience. Kevin Cheng and Paul A. Cairns conducted in playtests, that players may not even notice modal incoherences due to immersion. [7, pp.1272-1275] Arsenault concludes from this that immersion operates as a feedback loop, where "the more immersed one is, the easier it is to become even more immersed." [3, p.3]

Therefore, crafting a definitive definition of immersion proves to be impossible as it remains a highly subjective and situational phenomenon. However, by examining the dimensions and conditions of immersion, a practical framework of rules and guidelines for approaching immersion could be created upon which game design decisions can be oriented.

⁶ Bieger refers to the *relational theory of space*, according to which "space consists solely in the relations among bodies, and is not (as Newton claimed) an entity existing in its own right"

4.3 Immersion and player guidance

Since the established ruleset applies to gaming and game design in general, it is now necessary to reduce it to the factors that are directly influenced by player guidance.

The initial engagement depends on the player's subjective interest and general access to the game. Thus, it is not affected by player guiding. However, the willing suspension of disbelief can be negatively affected by player guidance systems that actively strengthen the player's disbelief by contradicting the game world. And also the involvement [as well as Brown and Cairn's atmosphere] can be taken away from the player by an overly hand-holding guidance system which makes attention to and interpretation of the games stimuli unnecessary. Thus, guiding strategies have significant influence on mental immersion.

The perceptual/sensory immersion depends on the audiovisual presentation of the game. Through overpowering the sensual cues from the real world, "the player becomes entirely focused on the game world and its stimuli." [10, p.7] According to this definition, player guidance does not influence this dimension of immersion.

But since both Ermi and Mäyrä as well as McMahan argue that the player should only focus on the game world [10, p.7] [19, p.77], this definition can be taken further to mean that non-diegetic elements that *overpower* the sensory cues from the actual game world, hinder immersion. In that sense, player guidance can have a high impact on perceptual immersion.

Arsenault's concept of fictional immersion states that the player does not reduce the fictional world to what is represented, but completes the cues in order to form a coherent understanding of the diégèse. One aspect of this is especially important is "space extending beyond the display" [23, p.158] since this is the requirement for the player to start exploring the game world – that they understand that there might be *something*. This is mainly caused by curiosity, as described by Ryan for temporal immersion. [24, pp. 8, 9, 11] Both aspects of immersion are affected by player guidance. On the one hand, guidance systems can encourage the player to explore the game world, but on the other hand, they can diminish curiosity by excessively guiding them.

Conversely, emotional reactions to the story and empathization characters are not influenced by guidance systems.

The *flow* concept can be applied to all operator acts in a video game: The guiding features should provide goals, immediate feedback and place the objective in a reasonable change of completion, this means that the "task difficulty" of navigating through and interacting with the game world should match the "user capability". In practice, obvious operator acts do not need to be guided, but rather complicated actions need to be guided properly. It is important to note that the capacity increases as the player gets experienced in a game. Therefore, player guidance should decrease over time so that the player does not feel under-challenged. For instance, the game should teach the player how to navigate through and interact with the game in the first place so that they realize their potential effectiveness on the game world and can reach constant input, the *behavioral mode of play* as well as the feeling of "movement as an embodied experience." After this initial tutorial, the leading can decrease.

The first characteristic of spatial immersion cited by Kühn is the "demarcation of the dividing line between game space an real space." This can be negatively affected by player guiding mechanisms that contradict the filmic qualities that create immersion.

The feeling of presence is also directly affected by player guiding strategies, as it relies on seamless interaction with the game space. It is important for deterministic mechanics and consistency, as both align the *expectations* for operator acts with the *conventions* of the game system. The same applies for the "agreeable action outcome," but since this is about machine acts, it is only indirectly related to player guidance.

Grip's rules also state that the guidance system should not be repetitive as the re-use of game elements lets the player feel the "fakeness" of the world.

dimension/level	Influenced by player guidance	Not influenced by player guidance
engagement		X
mental attitude		
willing suspension of disbelief	X	
involvement	X	
perceptual response		
real word / game world relation		X
non-diegetic / diegetic world relation	X	
response to narratives		
understanding of the diegese, curiosity	X	
emotional reactions to the story, empathy with characters		X
response to challenges		
flow, optimal experience; engrossment: tasks	X	
behavioral mode of play	X	
response to the spatial field		
demarcation between image and real space	X	
movement as an embodied experience	X	
presence		
constant input	X	
agreeable action outcome	(X)	
deterministic mechanics	X	
minimal repetition	X	

Figure 13 Conditions of immersive player guidance

5. Evaluation of player guidance systems

The developed system can be applied to all design decisions of player guidance mechanisms. In order to illustrate this further and derive general guidelines, this will now be demonstrated using two characteristic examples of guiding strategies. For this, various approaches of the UI design space from different games are collected, then compared with the framework of immersion and finally weighed against each other while also considering their general implementability.

5.1 Interaction with objects

Diegetic expressive acts such as “select, pick, get, rotate, unlock, open, examine, use” [p.24] are an integral part of every video game. But since “the amount of affordances deduced from a ... game space is always greater than the amount of affordances actually allowed by the rule framework, UI designers must amplify affordances allowed and suppress non-existing but deducible affordances.” [FL,p.65] Fagerholt and Lorentzon argue that this is crucial to enable presence, as a player trying to do things that are not allowed by the game rules might break this feeling. On the other hand, the player might play the game with a poorer set of actions than the rule framework allows if it was not properly mediated. [p.65]

5.1.1 Identification of the design space

The use of the informative guidance system is the most reliable: The relevant objects are marked in some way. This guidance strategy has four variants in the UI design space:

Spatial and diegetic indicators are within the game space. They can mark multiple interactables at a time and either automatically highlight all objects of interest, or are manually activated by the player, e.g. by pressing a button. Spatial markings are text, icons or colored indicators, whereas in the diegetic approach, text and icons are usually not possible since they have to be reasoned by a specialty of the narrative.



Figure 6 Spatial icons for collectible items in *Alba: A Wildlife Adventure* [T]



Figure 15 Diegetic marker reasoned by magic in *The Witcher 2: Assassins of Kings* [G]

Non-diegetic and meta hints, on the other hand, are not part of the game space, since they are presented as an overlay. As the HUD typically dedicates a specific location for each piece of information, the indication for an interactable object has its designated place too. Therefore, there is usually only one hint at a time, which is triggered when a specific object is targeted or approached.



Figure 16 Non-diegetic text when the crosshair is placed on an interactable object in *Firewatch* [D]



Figure 17 Meta indicator when the crosshair is placed on an interactable object in *Star Wars: Republic Commando* [N]

The cues of the interactive guidance system, on the other hand, are very subtle, since it relies on the player's curiosity, motivation and attention. In the current context, motivation based means that the player tries to interact with an item because it is tempting in some way; for example, the player tries to pick up a bundle of arrows because their quiver is empty.

This method is usually combined with light and color from the emotional guidance system, so that the player notices the object in the first place, since it is not explicitly marked. When working with light, interactive objects can be put in light and non-interactable objects in shadow. Similarly, in terms of color, objects of interest can be highlighted by coloring them in a contrasting color to the neutral palette of the surroundings.



Figure 18 Valuable loot is colored in a contrast to the environment in *Tomb Raider* (2013) [I]

Sounds can also be used to draw the player's attention to individual objects, either diegetically or non-diegetically. *Outcast – Second Contract* [B], for example, uses the voice of an "AI assistant" to indicate valuable loot.⁷ However, using sounds for this purpose is very unusual and oftentimes not possible to implement. Therefore, it will be not discussed further.

The following systems cannot be used:

The other guidance systems *can* be used to draw the players attention on objects, but are not worthwhile to be used throughout an entire open world. Character gesture, the processual and the narrative guidance system and movement are not quantifiable to the multitude of interactables found throughout vast open world games.

And since this genre is all about player agency, it is inappropriate to constantly limit their freedom of movement or action by using the spatial guidance system, specific camera angles or the environment. Furthermore, music can obviously not be used to indicate specific objects as it lacks precision.

5.1.2 Evaluation of the design space

Now that the design space is mapped out, the various approaches can be compared sequentially with the conditions of immersion.

Spatial-indicators tend to have the most negative impact on the willing suspension of disbelief, since they contradict the game world *within* the game world, whereas non-diegetic UI elements are only in the overlay. Furthermore, since most video games feature a HUD, thus making it generally accepted as obligatory part of the medium, the non-diegetic cues disguise themselves. On the other hand, meta, diegetic and motivation based indicators as well as contrast do not contradict the narrative and therefore help the player to suspend their disbelief.

Since involvement and atmosphere increase with the rising need to attend, less explicit guiding strategies enhance them the most. Therefore, motivation based guidance and contrast in light and/or color tend to perform the best. As non-diegetic and meta hints are presented in an overlay, they are still less explicit than diegetic and spatial cues that mark interactables directly in the spatial field. Thus, the latter are actually the least effective in this category.

In the extended sense of sensory immersion, the guidance should be as unobtrusive as possible in relation to the game world, making motivation based guidance, light/color, diegetic and meta clues a save solution, whereas non-diegetic and spatial approaches tend to be not suitable.

For curiosity to occur, the player has to initially realize the potential to discover *something*, all discussed player guidance mechanisms serve this purpose. But in order to not suppress curiosity, the player should feel as though they are making actual discoveries rather than just following the leading mechanisms.

Regarding the *flow*, the leading should provide clear goals and immediate feedback. All cues from the informative guiding system do this since interactables are specifically marked. But contrast is not as clear which is why it has to be combined with motivation based leading which does communicate goals reliably.

Furthermore, a task should be just barely within reasonable change of completion, so a distinction must be made as the user capacity increases. When the player is new to the game, they may need excessive guiding to learn how to interact with the game world. But as they become more experienced, they need less leading. Therefore, redundant indicators that show always the exact same information should be optionally not automatic, but rather manually activated by pressing a button or aiming on the specific object. Spatial and diegetic approaches should take this into account; meta and non-diegetic guidance strategies typically do this already. This is not even a concern for the interactive guidance system and contrast as both are always non-redundant.

For presence to occur, the interaction with the world has to be seamless: The allowed affordances should be mediated properly, whereas deduced possibilities that are not actually possible should be suppressed. The informative guidance system excels this in all variations since all interactables are indicated; those that are not are not interactive.

Light and color have again to be combined with the motivation based leading, since both may not be enough in their own. But combined, the user is motivated to search for interactables and is able to easily find them through their contrast, or vice versa: The player sees an object since it stands out and then is motivated to investigate further.

⁷ <https://youtu.be/5gk80hz38RA?si=3foHrxIH5Ep0UR5Z&t=4728>

Finally, a guidance system should not use the same indicators over and over again as this feels artificial. Spatial and diegetic markers from the informative guidance system run the greatest risk of standing out negatively here, as their clues stand out the most from the game world. Non-diegetic and meta guidance can also be pretty repetitive but it is less noticeable since they are only an overlay over the game world.

Motivation based leading and contrast excel in this regard as they depend highly on the situation which is why the same technique cannot be repetitively used.

5.1.3 Takeaway

The analysis has shown that diegetic guidance using contrasting levels of light and colors in combination with motivation based leading is the most immersive, as they seamlessly integrate into both the game world and gameplay.

However, these strategies may not be enough for every game, for instance because the player may not have a certain motivation all the time and should discover interactables just through their intrinsic curiosity. Then, little conspicuous informative diegetic or meta indicators should be implemented to additionally help to differentiate between interactables and non-interactables.

Yet, there are games where these two approaches cannot be utilized because player guidance cannot be integrated into the narrative. For instance, a game may strive to portray a rather realistic world without futuristic technology or magic that could be used as indicators for the informative guidance system. But since the interactables should still be reliably communicated, it only remains to mark them diegetically or spatially. This should be as unobtrusive as possible by aligning with the setting of the game.



Figure 19 Unobtrusive spatial indicators in *Life Is Strange* [J]

5.2 Orientation

Navigating through a game world demands more than just traversing terrain, it requires a profound sense of direction. Especially in an open world, without proper guidance, the player may feel lost in the vast environment, struggling with spatial orientation. Therefore, games have to implement features to enable the player to explore the world in their own pace, while ensuring they always feel grounded and oriented in the virtual environment.

5.2.1 Identification of the design space

The informative guiding system is again the most reliable as it is easily available and very informative. It helps the player to orient themselves through maps, compasses and markers. It can be implemented in four variants of the design space:

Non-diegetic and meta-elements, as they are outside of the game space, can be depicted in the HUD. Commonly used is the minimap, a top-down presentation of the nearby environment. It shows the current position of the player and typically also icons for nearby objects and locations of interest, NPCs and the tracked quest.



Figure 20 Spatial minimap in the characters helmet in *Outer Wilds* [O]



Figure 21 Non-diegetic minimap in *The Witcher 3: Wild Hunt* [H]

Alternatively, an abstract compass can be used. It shows the celestial direction and icons based on the viewing direction.



Figure 22 Non-diegetic compass in *Skyrim* [C]

It is also possible to draw an entire map onto the HUD with the press of a button. Thus, the player does still see a part of the game space while consulting the map.



Figure 23 Non-diegetic map in *The Witcher* [F]

On the other hand, the map can be displayed in a separate menu. As non-diegetic approaches do not have a connection to the narrative of the game, they depict an abstracted map, typically filled with many icons that point the player to locations worth exploring or note their discoveries so far.



Figure 24 Non-diegetic map in *Horizon: Zero Dawn* [M]

Conversely, meta menus portray the map as part of the fiction. The depiction depends on the genre of the narrative; for example, a futuristic map could feature dynamic symbols, while a paper map could look like illustrated by the player character.



Figure 25 Meta map and quest journal in *Oxenfree II: Lost Signals* [P]

The other two variants of the informative guidance system, diegetic and spatial, draw the cues directly into the spatial field. In the case of the map, the two approaches usually merge. Their implementation differs depending on the per-spective: In first-person, the map is held by the player character in front of them; conversely, in third-person, it is displayed next to them.



Figure 26 Diegetic map and compass in *Firewatch* [D]

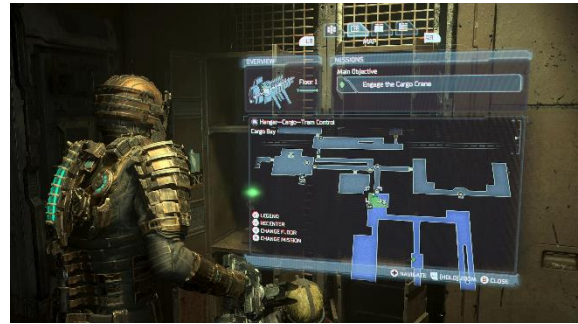


Figure 27 Diegetic holographic map in *Dead Space* [K]

The game can also use spatial markers to point out where to go, for example following the current quest. Thus, they are typically activated manually.



Figure 28 Spatial marker in *Tomb Raider* (2013) [I]



Figure 29 Diegetic marker by Aloy's focus in *Horizon: Zero Dawn* [M]

Since the interactive guidance system is motivation based, it relies on curiosity-inducing properties of the nearby environment. These can be found while exploring and help the player to determine their current position as well as where they can go next. This system relies on diegetic clues such as signposts.



Figure 30 Signpost in *Firewatch* [D]



Figure 31 Signpost in *A Short Hike* [A]

Points of orientation from the spatial guidance system help the player to deduce their relative position in the game world and possibly inspire them to examine these landmarks. They are typically diegetic.

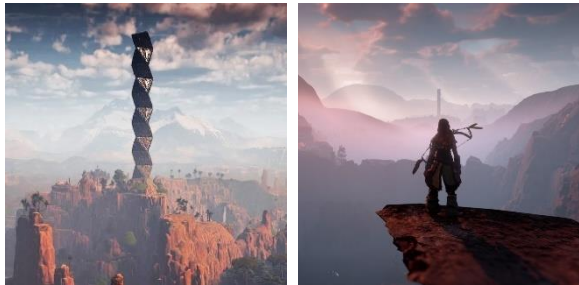


Figure 32 The late game location *spire* can be seen all the way from the starting area in *Horizon: Zero Dawn* [M]

The following systems cannot be used:

Again, the other guidance systems can be used mediate a sense of direction but are not worthwhile to be used throughout an entire open world. Interpersonal interactions, the narrative and the processual guidance system as well as light, color, movement and sounds can help the player orient themselves but are not quantifiable throughout an entire open world; therefore, they need to be backed up with other guidance systems.

And yet again, since this genre is all about player agency, the player's freedom should not be limited by architectonic elements, natural obstacles the camera and the environment.

Music can also help the player orient themselves, for instance by having one soundtrack for every area, but this is simply not enough.

5.2.2 Evaluation of the design space

The various design variants can now be compared sequentially with the conditions of immersion.

The willing suspension of disbelief is affected by the credibility of the presented world. Informative diegetic and meta elements as well as the interactive guidance system and points of orientation do not contradict the fiction and are therefore believable. Non-diegetic and spatial hints, on the other hand, oppose the narrative and thus are detrimental.

The interactive guidance system and points of orientation are the most beneficial for involvement because they enhance the "depth" of the world by making it relevant to attend, rather than simply providing the information outright.

All variations of the informative guiding system do exactly this and are therefore less involving. But there is a gradation: A map has to be interpreted in

the first place and therefore involves the player more than a minimap, an abstract compass or markers as they just plainly tell the player where to go, without any cognitive demand.

The interactive guidance system, points of orientation, diegetic and meta indicators are also most beneficial to the extended sense of sensory immersion because they are within the game world. Conversely, spatial and non-diegetic cues, especially menu screens that are completely overpower the spatial field, are obtrusive.

Guidance should encourage the player to explore the game world instead of killing their curiosity through excessive leading. This means that the navigational guidance should leave things for the player to discover on their own. The interactive guidance system and points of orientation naturally do this, but the informative guiding system has to be careful to not give too much away.

The minimap, compass and markers should be just useful enough so that the player knows how to progress, but cannot rely solely on them, as blindly following the marked path on a minimap or a marker takes away the player's autonomy.

Maps of all kind have to be even more cautious since they typically represent the entire world. A solution for this is a dynamic map that evolves with the player's discoveries. For example, non-diegetic and spatial maps could use a fog of war that clears when the areas are explored, diegetic and meta maps, on the other hand, could be pieced together by finding a fragment at each location or having the main character write directly onto the map.

All variants of the informative guidance system can arouse and suppress curiosity on their own way, which is why it cannot be generalized which one is the best in this respect.



Figure 33 Fog that can be cleared by exploring areas or overriding a Tallneck in *Horizon: Zero Dawn* [M]

In terms of the *flow*, all strategies mediate a goal to strive for. When it comes to feedback, the informative guiding system is the most reliable since it directly displays the relation of the player to the goal, whereas the other two systems only indirectly mediate it.

Regarding the reasonable chance of completion, the player requires extensive guidance when they are new to the world. But when they become more familiar with the game environment over time, they eventually develop their own sense of orientation and navigate the surroundings independently. Thus, they need guidance less frequently and should be able to scale it according to their needs by activating and deactivating guidance features. Maps and markers typically fulfill this already because they are manually triggered and can be consulted when the player is in need. Minimaps and abstracted compasses, on the other hand, run the risk to provide obsolete information and therefore should not be fixed on the HUD but adaptable. Thus, the informative guidance system depends on the individual implementation.

On the other hand, the interactive guiding system and the points of orientation are not as intrusive but rather must be explicitly attended to. As such, they cannot overly guide the player, but run the risk of being not enough at the earlier stages. This is why they are usually backed up with indicators from the informative guidance system, especially in open worlds.

The filmic qualities that demarcate the “dividing line between game space and real space” are not affected by most leading systems but directly ruined by menu screens used by non-diegetic/meta guidance to display maps as they completely overlay the game space and therefore destroy the player’s spatial imagination. This is why menus should be avoided as much as possible.

5.2.3 Takeaway

The exploration has shown that the interactive guidance system and points of orientation which are both usually diegetic are the most immersive because they not only integrate seamlessly into the game world, but also make it necessary to attend. But those strategies are rarely enough to guide the player through the environment, especially in vast open world games. There, the informative guiding system is indispensable: Diegetic maps and markers and/or meta minimaps and compasses should be used to lead the player.

Only if the setting of the game does not allow for such a seamless integration, adjustable spatial markers and/or an inconspicuous non-diegetic overlay can be utilized to further guide the player. Menu screens should be totally avoided since they tear the player out of the game and can be easily replaced with diegetic maps or displayed on the HUD.

6. Conclusion

From the theoretical and practical examination of the influence of diegesis on immersion throughout this term paper, general guidelines for immersive player guidance can now be derived.

Leading strategies should first and foremost be player enabling. This means that they do not just plainly tell the player where to go and what to do, but rather let them explore the conventions of the virtual world on their own, based on deliberately placed unobtrusive leading strategies.

Because the player is only indirectly guided, they have to fully attend and focus on the game in order to progress, thus creating involvement and *flow*. This strategy does also arouse curiosity since it is all up to the player to explore the world without preempting. Furthermore, it feels natural because player guidance is not repetitively imposed on the game but seamlessly integrated into the game world and story.

This underlines the importance of cautious player guidance and explains why games that “hold the user’s hand” too much are considered negatively. However, in this context, player leading is always diegetic. This underlines the general importance of diegetic leading, but does not help to specifically delineate diegetic and non-diegetic features.

With the informative guidance system, in contrast, the decision between diegetic (including meta) and non-diegetic (including spatial) strategies has to be made anew with each game. This term paper has unraveled this dichotomy by comparing the two methods with the conditions of immersion:

A diegetic approach has been proven to be the most immersive in strengthening the believability of the game world, engulfing all senses with a coherent setting and contributing to the filmic qualities of the medium. But diegetic cues do not outdo non-diegetic ones in every dimension of immersion: Both variants have been confirmed to be equally *capable* of promoting presence, flow, involvement and curiosity.

Whether they actually enable these immersive qualities does not depend on *how* the details are conveyed according to the diegetic design space, but primarily on *what* is mediated: It should be effective, reliable and not overwhelming. This means in practice, that a poorly executed diegetic guidance system is much less immersive than a reliable non-diegetic approach.

This can be reasoned with Brown and Cairn's level model of immersion: The game has to provide the necessary information to reach engagement, act reasonably and not get frustrated. Only if this is the case, the player can get immersed on a higher level into rules and fiction, including the diegetic design of game space and user interface. This means that the primary goal of player guidance is to ensure engagement and only secondly to be diegetic.

However, since diegetic guiding does only use cues from the narrative world to communicate the game system, it can only be utilized if rules and fiction are compatible. If they are not, the diégèse has to be made more complicated to contain the game rules, or the ruleset has to be simplified. This means that the immersive quality of diegetic guidance comes at the cost of significantly limiting the game design space, both narratively and systemically.

But if the game designer has as already a fixed concept of the diégèse and rules and both are not consistently compatible, only non-diegetic guiding strategies can be used to reliably communicate the game system. These should be as unobtrusive as possible by adapting to the game's setting and displaying only relative information at a time, as then the player is likely to accept it.

In conclusion, the analysis has shown that diegetic guidance has a positive impact on immersion but can only be implemented if it is able to reliably mediate the game rules. Therefore, one of the first decisions in the initial conception phase of a game should be player guidance to adapt the narrative and the system if necessary.

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Authors	Overview of the presented dimensions of immersion				
Taylor (2002)		diegetic immersion: Immersion in the act of playing a video game: acting <i>upon</i> the game.		intra-diegetic immersion: Immersion in the experience of spatial and narrated space: acting <i>within</i> the game.	
	A mental response	A perceptual response	A response to narratives	A response to interaction	A response to the spatial field
McMahan (2003)		Perceptual immersion: The feeling of being surrounded by the virtual environment that increases proportionally with artificial stimuli	Psychological immersion: The mental absorption caused by the experience of the world of a game's story and especially interacting with the game's system and environment.		
Ermi and Mäyrä (2005)		Sensory immersion: The sensation of being surrounded by the audiovisual representation of the virtual world that overpowers sensory information from the real world	Imaginative immersion: The feeling of mental absorption into the game's world, stories or characters	Challenge based immersion: The experience of being mentally absorbed caused by challenges of motor or mental skills.	
Arsenault (2005)		Sensory immersion: The feeling of being enveloped by the multisensory representation of the virtual world that overpower sensory cues from the real world	Fictional immersion: The illusionist concept of realism gives the player the sense that the game world extends beyond what is depicted	Systemic immersion: The system (rules, laws, etc.) governing the game replace the system governing a similar facet of unmediated reality	
Anja Kühn (2007)	Mental immersion: The player suspends their disbelief and accepts the game world as a model of reality		Narrative immersion: Empathization of the game characters through narrative and constellation of individuals	Systemic immersion: The player's actions and the game's reaction form a behavioral system; player accepts the game rules and disregard norms that contradict it	Spatial immersion: The recipient is drawn into the scenography, the dividing line between image and real space is demarcated
Maria-Laure Ryan (2008)			Narrative immersion: Engaged imagining of the story world: <i>spatial immersion</i> (by sense of place and joy of exploration), <i>temporal immersion</i> (by desire to know what happens next) and <i>emotional immersion</i> (by affective reactions to story and characters)	Ludic immersion: A state of deep absorption in the performance of a task	
Ernest Adams (2013)		Narrative immersion: The player is completely involved and accepts the world and events of the story as real		Tactical and strategic immersion: A state of intense preoccupation with fast responses to obstacles or with observation, calculation and planning	Spatial immersion: The player has the feeling of being in a different place than they actually are