Defining Art Styles in Games and Their Influence on Creative Expression

Shaif Ali Hemraj

University College London, United Kingdom

Abstract

This article explores and highlights the differences between art styles in video games, and details how the use of them can allow for the expression of creative ideas and communicate messages through games as a medium. This article also investigates existing research and analyses various case studies of games with distinctive art styles. The term "art style" in the context of this article pertains to visual elements such as proportions and shading techniques, as opposed to encompassing sound design or animation. To effectively showcase the influence of art styles on creative expression, I have developed a practical prototype in the form of an art game titled *The Maze of Nightmares*, which contains features such as the ability to switch between multiple art styles as a creative tool to overcome obstacles. By doing so, the game addresses the topic of significant personal changes and how impactful they can be towards one's life, especially in the context of overcoming obstacles and solving problems. This way, players and audiences can observe differences between art styles in the context of an experience that reinforces the benefits of change.

Keywords

Art style; creation; expression; game development.

Press Start 2024 | Volume 10 | Issue 1
ISSN: 2055-8198
URL: http://press-start.gla.ac.uk

Press Start is an open access student journal that publishes the best undergraduate and postgraduate research, essays and dissertations from across the multidisciplinary subject of game studies. Press Start is published by HATII at the University of Glasgow.

Introduction

In the field of digital media, innovation is crucial for ensuring that products stand out, and video games are no exception (Edery & Mollick, 2008, p. 183). Video games have become more than just interactive entertainment, with many being used as a form of expression to examine social, political, and artistic themes (Flanagan, 2009, p. 15). These transformative developments have allowed developers to use new tools to express new and creative ideas, while also using visual components as a vehicle for that purpose (Fullerton, 2014, p. 93). Because of the overall potential for creative expression in games, some developers wish to push the medium in purely artistic terms (Nyugen, 2020, pp. 2–4). Whether video games constitute an art form has been subject to much debate, with a notably infamous example coming from film critic Roger Ebert (2010), who argued that games as a medium lack the characteristics to be classified as art and should not be categorised as such. This article suggests that this is not the case, as the rise of the video game medium as a whole has led to more cases of developers creating products for the sole purpose of artistic and creative expression (Bourgonjon et al., 2017).

In games development, an interplay between aesthetics, art styles, and graphics exists, as each element can potentially influence various aspects such as the visual experience as well as how audiences perceive information. The application of aesthetics, defined as the combination of many art elements into a "cohesive whole" (Adamo, 2018, p. 3), determines how a game looks. Art styles, however, define the overall artistic direction and approach of a game, and have a significant impact on creative expression (Power, 2009). Graphics are also an important aspect, as they are the technical rendering techniques that make displaying images on a screen possible (Madeja, 1983). Graphics are notable in that they can serve aesthetics and art styles through additional visual details which can make them easier for audiences to perceive. However, the presence of less realistic or minimalist artistic components can require an emphasis on colours and shapes for effective visual communication (see Figure 1).

Figure 1. *International Soccer* (M Network, 1980; left) and *Pole Position* (Namco, 1982; right). Simple abstract shapes and colours visually communicate the context of the games. Image sources: Metro (2015) and AtariAge (n.d.).

In this research, I will investigate and discuss whether the choice of art style can influence creative expression in video games. To guarantee the accuracy of the research findings, I will present data collected from articles, interviews, books, and papers while also using illustrative existing video games as case studies. As part of my research, I will conduct a closer look at a genre of games known as "art games" that emphasise both artistic and creative expression. These games essentially use a combination of both to communicate an overall message through gameplay (see Parker, 2012). For the practical component of my research, an art game titled *The Maze of Nightmares* will be presented, with the purpose of highlighting what sets art styles apart from each other and how their usage can influence creative expression. It is worth noting that art games are quite different from conventional games, where the primary goal often leans towards entertaining players with fun gameplay. However, a comprehensive analysis by Pearce (2006) demonstrates how art games can still contain many of the essential components present in other games, which include qualities such as goals, obstacles, and rules.

2. Literature Review

2.1. The Classification of Art Styles

Järvinen's (2002) research stated that the continual evolution of the games industry has allowed for artistic components in games to become more distinct and discernible, facilitating an emergence of innovative visual styles and directions. As a result of these additional options for artists, questions have been raised amongst researchers regarding what makes each art style different and how they should be classified. Cho et al. (2018) argued that conversations surrounding the classification of art styles could stem from people having varying, subjective perspectives about a particular look. The lack of a clear consensus on how art styles

should be defined can cause confusion and miscommunication among artists in the gaming industry (Wattanasoontorn et al., 2019).

Furthermore, the choice of an art style can affect the way audiences perceive what a game is presenting (Hölttä, 2018, p. 63). Visual elements in video games should serve to highlight affordances in an interactive virtual environment, informing players as to what is possible (Cardona-Rivera & Young, 2013). Through the affordances provided by a game's overall visuals, players can adapt to a game's environment and mechanics, such as how a ladder in one area may inform the player that it is possible to climb to another (Spahn, 2017, p. 17). In games, affordances can also be conveyed in an aural, haptic, or textual manner, such as through controller vibrations, on-screen prompts, or sound effects. These can additionally assist players by working as a reinforcement for visual cues. However, if a video game's art style does not align well with its overall gameplay, it can lead to contradictions that may disrupt the user's experience by causing confusion or misleading them (Sarver, 2021, p. 15). The ability of a video game to successfully communicate information to its audiences is vital to ensuring that players can understand what to do and why (Koster, 2014, p. 148). For this reason, the choice of an art style used for a game can play a significant role, especially when developing products that intend to express creative ideas.

The challenges that can come with classifying these art styles, as well as the influence each can have on both user experience and communicating key information, are reasons as to why I intend to use both theoretical and practice-based research in this article. By doing so, I can identify what characteristics can distinguish art styles from each other, alongside showcasing the affordances each style can provide through visual design. For the purpose of this research, I define creative expression within the context of Flanagan's (2009) theory, which states that video games can serve as "instruments for conceptual thinking, or as tools to help examine or work through social issues" (p. 1). Flanagan also emphasises video games encompassing various forms of expression, including aesthetic exploration, storytelling, and personal expression.

Järvinen's (2002) research notes that the games industry is frequently evolving with new advancements leading to the rise of new visual directions. In this article, I will discuss three notable examples of existing art styles in games, which remain consistent throughout modelled frameworks as presented by Cho et al. (2018; see Table 1) and Wattanasoontorn et al. (2019; see Table 2). These styles are commonly referred to as (photo)realistic, stylised (caricature), and simplified (minimalism). It is notable, however, that both frameworks define art styles on different levels of abstraction, as Wattanasoontorn et al.'s overview argues for an emphasis on varying levels of art styles, while Cho et al. propose a far broader spectrum. As a result of this, I will explore both frameworks in this research, as well as the merits and

limitations of each. Upon defining the characteristics of these art styles and how they can impact video games, this article will showcase the relationship between them and creative expression.

No.	Visual style	Games
1	Abstract	Splashy!
2	Simplified	Minecraft
3	Simple Stylized	Fling Fighters
4	Stylized	Oceanhorn ™
5	Simple Silhouette	Limbo
6	Silhouette	Playdead's INSIDE
7	Semi Realistic	Life Is Strange
8	Photo Realistic	Assassin's Creed Identity
9	Semi Exaggerated	Lineage2 Revolution
10	Photo Exaggerated	Injustice 2

Table 1. List of visual styles structured in Wattanasoontorn et al. (2019).

1. abstract	**7. handicraft**
1.1. psychedelic	**8. Lego**
1.2. text	**9. maplike**
2. black & white	**10. minimalism**
3. bright	**11. pixel art**
4. caricature	**12. realism**
4.1. cel-shaded	12.1. illusionism
4.2. comic book (anime/manga)	12.2. photorealism
4.3. watercolor	12.3. televisualism
5. colorful	**13. silhouette**
6. dark	

Table 2. List of visual styles structured in Cho et al. (2018).

2.2. Discussing and Defining Specific Art Styles

Photorealistic Art Styles in Games

The term "photorealistic" in games is often the subject of debates, with scholars contending that games can be selective regarding how accurately they depict reality (Pötzsch, 2022, p. 2). Like television and films, games may feature elements of cinematography such as film grain and tone mapping to achieve a desirable look, often making them more reminiscent of a photo or video as opposed to real-life (Gotanda, 2010). While games may not always contain visuals that look truly convincing if not mediated by a screen, photorealistic art styles tend to be consistent in how they utilise visuals elements to push towards a "likeness with reality" (Cho et al., 2018, p. 645). For the purposes of this article, I will define video games that meet these criteria as photorealistic, due to shared characteristics (see Figure 2).

Figure 2. Games with photorealistic art styles. Examples are *Grand Theft Auto V* (Rockstar North, 2013; left), *The Last of Us Part II* (Naughty Dog, 2020; middle), and *Red Dead Redemption 2* (Rockstar Studios, 2018; right). Image sources: Rare Gallery (n.d.), Tailford (2018), and Good (2017).

For instance, the application of lighting in photorealistic games can require reflections, colour gradients, and complex shadows to truly achieve a lifelike aesthetic (Jarvis, 2013, p. 33). The need for detail can also impact artistic components such as 3D models, which may have to consider elements such as depth, size, texture quality, and lighting to appear more natural and convincing (Dinur, 2021, p. 1). Photorealistic characters in particular can benefit from accurate body proportions without exaggerated elements, as stylised features are more associated with non-realistic visuals (Zell, Zibrek, & McDonnell, 2019, pp. 1-17).

Games can still maintain realistic visuals while also featuring unrealistic and fantastical content, provided that authentic elements are removed to a limited degree. Wattanasoontorn et al. (2019) have noted this phenomenon through the use of categories such as "semi-realistic" to describe cases in which realistic elements are strongly minimalised despite being present, to emphasise their notable and distinct attempts to stray from reality. Järvinen (2002) established that realistic games with fantastical elements should be classified under a subcategory known as "illusionism," providing the art maintains a photorealistic lifelikeness. This is further supported in Cho et al.'s (2018) framework, although the topic of non-realistic elements in photorealistic games is instead classified separately in Wattanasoontorn et al.'s framework, under the name "photo exaggerated."

Stylised Art Styles in Games

According to Gooch (2001), stylised visuals emphasise communication using non-photorealistic rendering by creating the illusion of reality without simulating it entirely (p. 1; see Figure 3). By doing so, games with stylised visual elements can contrast from those that attempt to portray a conventionally realistic aesthetic through an emphasis on less natural features and abstraction (Järvinen, 2002). However, it is relevant to note that the term "stylised" can be quite broad due to the

variety of stylised rendering techniques available to developers (Wattanasoontorn et al., 2019). Such techniques can allow for a variety of approaches like allowing games to mimic the look and feel of paintings, comics, and cartoons (Cho et al., 2018). According to Manning and McCloud (1998), the application of cartoon-like elements in art can also amplify characteristics through simplification, a process in which specific details are focused on to communicate concepts and ideas rather than reality (p. 67). This can be achieved using caricature, in which an individual or thing is simplified and exaggerated to emphasise characteristic features (Rhodes et al., 1987).

Figure 3. Games with different stylised rendering techniques. Examples are *Jet Set Radio* (Smilebit, 2000; left), *The Legend of Zelda: The Wind Waker* (Nintendo, 2002; middle), and *Dordogne* (UN JE NE SAIS QUOI, 2023; right). Image sources: Colwander (2022), Philip (2013), and Webster (2020).

From an artistic perspective, introducing fantastical and imaginative elements can provide an element of flexibility and freedom when crafting creative ideas (Power, 2012). By incorporating and embracing fantastical elements, artists can design characters, environments, and objects that are more unique in both appearance and functionality (Järvinen, 2002). Additionally, this can support exaggerated elements in characters, which artists can use to convey emotions such as intensity and sincerity more effectively (Cissell, 2014). These transformative methods can aid creative expression, as formative art uses the process of exaggeration as opposed to simple reproduction (Shon & Seo, 2005). By stripping down visual elements to their "essential meaning," such as employing minimalist colour palettes and intentionally removing unnecessary details in models, artists can amplify the core visual aspects of artistic components in ways that are not possible through photorealism (Manning & McCloud, 1998, p. 67).

Simplified Art Styles in Games

While stylised games may include non-realistic elements, simplified visual components are presented in a more minimalistic fashion (Lankes, 2020). As a result, minimalistic visual characteristics can reinforce the most vital aspects to amplify elements through simplification. This

allows for a more streamlined experience in which the general context is communicated more clearly, as less is essentially more (Obendorf, 2009, p. 5). Prior research by Nealen et al. (2011) argued that an emphasis on essential elements can increase overall coherency, contrast, and affordances. The application of lighting and shading may vary in games with a minimalist visual style, with some containing rendering techniques associated with photorealism, such as detailed shadows and realistic lighting, while others may adopt contrasting characteristics, such as exaggerated elements and flat colour shading techniques (see Figure 4). This illustrates why misconceptions between art styles may occur, as overlapping elements can be present. However, the lack of detail in artistic assets is notably consistent in games with simplified visuals, which sets them apart (Wu, 2012, p. 12).

Figure 4. Games with simplified art styles. Examples are *Minecraft* (Mojang, 2011; left), *SUPERHOT* (SUPERHOT Team, 2016; middle), and *Lara Croft GO* (Square Enix, 2016; right). Image sources: Sirani (2020), Bellingham (2022), and Imms (2016).

2.3. Defining Art Styles Through the Use of Characteristics

To produce artistic assets that match the aesthetic of an intended art style, specific characteristics need to be taken into consideration during development (Omernick, 2004, p. 107). These characteristics pertain to the process of modelling, texturing, and lighting, as each can impact the overall appearance of a video game and are what makes each art style unique (Sundkvist, 2022, p. 12). Shaders, which are programming scripts or programs that can determine how 3D models display lighting details, effects, and colours (Hergaarden, 2011, p. 2), can play a significant role due to their ability to allow for added effects that can contribute to specific art styles, such as outlines that emphasise features. Video games developed with any art style need shaders that follow specific instructions to achieve intended visual appearances.

The unique characteristics featured in art styles can also be combined to support different aesthetics. For this reason, Wattanasoontorn et al. (2019) argued that classifying art styles should take these varied characteristics into account. For instance, the use of caricature and exaggeration are strongly associated with stylised visuals but can still be

combined with shading or lighting methods used in photorealistic games to create "semi-realistic" or "photo-exaggerated" visual styles (Wattanasoontorn et al., 2019).

2.4. The Artistic Outcomes of Chosen Art Styles

The overall influence of detailed features and light depth in rendering can make a significant impact towards achieving lifelike visuals, as realism necessitates detail, while simplicity is often associated with non-realistic art (Keating et al., 2017). Video game artists that intend to achieve realistic visuals can combine texture maps and advanced lighting techniques with shading to emphasise details on relevant surfaces (Malzbender et al., 2001). Alternatively, a video game that aims for stylised visuals could potentially achieve an intended look with shading algorithms that display few colours with less lighting detail.

The practice of simplifying visuals can also extend to the overall form and proportions of a 3D model, as they can vary in terms of complexity based on the chosen art style (Wattanasoontorn et al., 2019). For instance, character models can be created with exaggerated body features and reduced details in specific areas if an art style intends to embrace a more cartoon-like appearance. Doing so can amplify its appearance through simplification, allowing for artists to "bring clarity to the depiction of featured characters" (Hill, 2016, p. 125). As a result, textures and models created with specific art styles may look unusual with different shaders, such as *The Legend of Zelda: Breath of The Wild* (Nintendo, 2017; see Figure 5).

Figure 5. *The Legend of Zelda: Breath of The Wild* (Nintendo, 2017): character model with intended cel-shading (left) and a different shader (right) showcased by Samuraisaac (YouTube, 2021).

3. Case Studies

There are various examples of games that effectively demonstrate how the application of art styles can allow for distinct visual characteristics. A notable example comes from *The Stanley Parable* (Galactic Café, 2013), which contains photorealistic, artistic characteristics such as high-fidelity models, shadows, and textures. This is reinforced by the use of shading,

which contains gradients that allow for more lifelike lighting. Conversely, a video game needs to clearly and intentionally contain less detail for it to be classified as a game with a simplified art style. *SUPERHOT* (*SUPERHOT* Team, 2016) is a notable example that does so with clear artistic intent, as it "embraces digital technologies' inherent abstraction" (Morales, 2018, p. 48) through shading techniques to reinforce the theme of being in a video game. This provides additional benefits as well, as minimalist elements can declutter the screen, allowing players to focus on essential gameplay features (Hanson, 2018, p. 1).

Video games with stylised visuals, however, can maintain a distinct appearance through changes in overall form and shading that embrace elements such as flat colouring and exaggeration. A notable example of flat colouring used in games comes from the cel-shading technique, a process involving the utilisation of shading effects to avoid gradients in colours to support a flatter, cartoon-like appearance (Maic & Niklas, 2005). *Jet Set Radio* (Smilebit, 2000) applies elements of caricature and cel-shading throughout its 3D models, which can allow for a visually pleasing, yet simple look. McLaughlin (2010) argued that the overall level of detail in stylised video games can range from low to high, which sets them apart from simplified and photorealistic art styles, as they both have a pre-defined standard for detail (see Figure 6).

Figure 6. 3D models in *The Stanley Parable* (Galactic Café, 2013; left), *Jet Set Radio* (Smilebit, 2000; middle), and *SUPERHOT* (SUPERHOT Team, 2016; right) vary in terms of detail and shading. Image sources: Valve (2012), Fandom (n.d.), and PlayStation (n.d.).

While video game developers often strive towards a unified and consistent approach within visual elements (Liapis et al., 2013), there are cases of games in which multiple art styles are featured. *Kingdom Hearts II* (Square Enix, 2005) and *Fortnite* (Epic Games, 2017) exemplify this, as both involve character interaction between different franchises that vary in terms of visual style (see Figure 7), making it suitable within that context. The existence of video games with multiple art styles can bring into question whether existing frameworks that intend to classify them should take such examples into consideration.

The choice of using multiple art styles can also require video game artists to make sure that visual elements are presented in ways that can allow audiences to understand what they are. For example, if a ladder is modified so that it no longer resembles one, the affordance of it can be impacted, making it less recognisable as a climbing tool (Spahn, 2021).

Figure 7. Characters in *Kingdom Hearts II* (Square Enix, 2005; left) and *Fortnite* (Epic Games, 2017; right) vary in terms of art style and characteristics. Image sources: Bellingham (2022) and MacLeod (2021).

Some video games also feature art styles and characteristics that are not consistent throughout the experience. *Final Fantasy VII* (Square Enix, 1997) exemplifies this, as it contains simplified character models when traversing the overworld, but switches to detailed, stylised models during combat (Brown, 2016; see Figure 8). Examples such as these show that artistic consistency throughout video games is by no means mandatory. Developers can take advantage of this by intentionally incorporating simplified visuals in certain areas that only focus on the essentials, which can help make video games feel more accessible. *Final Fantasy XV* (Square Enix, 2016) uses this strategy, as it was recreated as a mobile game titled *Final Fantasy XV: Pocket Edition* (Square Enix, 2018) with a semi-simplified visual style for the purpose of creating a more streamlined experience (Purnomo et al., 2021; see Figure 9).

Figure 8. Cloud Strife's overworld model with simplified attributes (left) and stylised combat model (right) in *Final Fantasy VII* (Square Enix, 1997) vary in terms of detail and complexity. Image source: Lohrenz (2019).

Figure 9. *Final Fantasy XV* (Square Enix, 2016; left) compared with *Final Fantasy XV: Pocket Edition* (Square Enix, 2018; right). Image source: Andriessen (2018).

4. Developing *The Maze of Nightmares*

4.1. Practical Component Overview

To showcase how art styles in video games can be uniquely defined while also influencing creative expression, I conducted practice-based research in the form of developing an art game titled *The Maze of Nightmares*. The premise involves a man in a coma-induced lucid nightmare navigating through a maze to overcome subconscious feelings of fear and resentment on a journey of self-discovery and personal transformation. I used the maze as a thematic device to represent mixed feelings, with the obstacles working as a metaphor for confronting challenges. To complete the game and reach the end (by waking up from the dream), the player must utilize game mechanics that allow them to control elements and modify the environment to overcome obstacles. This is further enhanced by the switching of art styles to reinforce the concept of change, which suits the game's overall premise of controlling and modifying elements of a dream world.

The idea of alternative versions of rooms with different layouts and visual aesthetics suits this narrative context, as the act of lucid dreaming can allow people to have a certain element of control within their dreams (Lemyre et al., 2020). For instance, the player can simplify areas to emphasise details, as simplified visual styles naturally communicate information through an emphasis on only the essentials (Obendorf, 2009, p. 5). The player can also stylise elements to embrace non-realistic concepts, such as generating surreal tools to overcome obstacles. This works in relation to stylised visuals, as they often contain fantastical and imaginative elements that stray from photorealism (Järvinen, 2002). By using mechanics that additionally change visual elements, audiences can observe the differences between these three art styles. Upcoming sections will illustrate the development process and highlight how tasks were carried out during production.

4.2. Pre-Production

Research and References

To determine the production techniques needed to recreate the simplified, stylised, and photorealistic art styles I planned to feature in this game, a research process on how to reproduce artistic components in these styles was needed. Many online guides for software such as Autodesk Maya, Adobe Photoshop, and Unity showed how to achieve these art styles, allowing me to utilise all three effectively in the project and to learn new techniques for each style. Examples included videos on how to create shading scripts and modify the level of detail in models.

Upon studying the processes involved in creating assets for each of the three art styles, I then shifted my focus towards analysing pre-existing cases of games that contained these styles. *The Stanley Parable* was a primary influence on both the office-themed setting and the focus on gameplay that emphasises exploration with environmental storytelling. The use of photorealistic visuals in this game helped me to determine what features a digitally rendered office in this art style could have, particularly in relation to lighting, shading, and the inclusion of detailed 3D models and textures (see Figure 10). *SUPERHOT* was also studied due to its use of office environments in combination with a simplified aesthetic that supports a minimalistic art direction. Analysing each of these games gave me ideas on how to support the overall design process regarding the layouts of office rooms and mazes, as well as how the objects and materials featured could appear in those environments. Doing so also allowed me to determine what could be extrapolated and used for the photorealistic components in *The Maze of Nightmares*. For instance, I was able to replicate walls and ceiling tiles with depth (see Figure 10) by creating texture maps in Materialize to support realistic displacement for tile textures in the Unity engine.

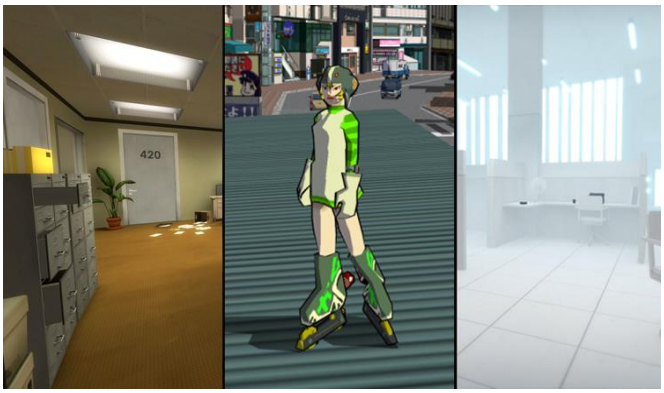

Figure 10. Artistic references taken from games. *The Stanley Parable* (Galactic Café, 2013; left), *Jet Set Radio* (Smilebit, 2000; middle), and *SUPERHOT* (SUPERHOT Team, 2016; right). Image sources: SUPERHOT (2020), Kollar (2013), and Lee (n.d.).

The simplified aesthetic of *SUPERHOT* lacked these additional details and featured low poly 3D models with a colour palette that mainly emphasised shades of white (see Figure 10). The game, however, benefits from stripping away elements, as doing so can amplify its visuals through simplification (Manning & McCloud, 1998, p. 67). The stylised visual aesthetic of *Jet Set Radio* has similar benefits and contains a more distinctive appearance with prominent characteristics such as cel-shading, flat colouring, and outlines (see Figure 10). In the end, those elements played a role towards influencing how simplified and stylised sections would appear in *The Maze of Nightmares*.

Concept Art and Planning

Upon determining the environmental setting for *The Maze of Nightmares*, I produced a core game loop to work as a guiding foundation for the mechanics to be developed around (see Figure 11).

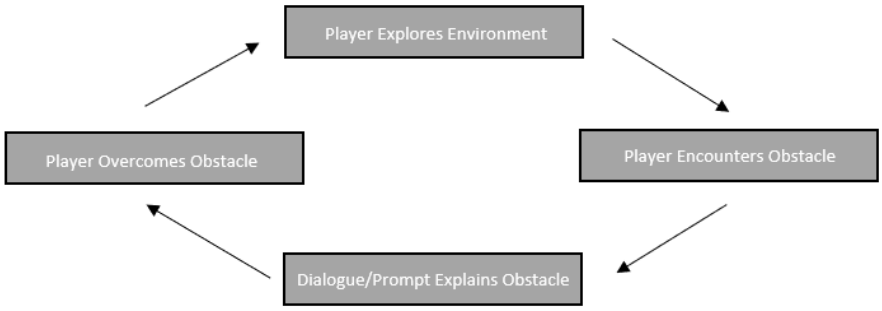

Figure 11. Core game loop of *The Maze of Nightmares*.

Constructing a concept design of the entire game map was important, as it helped guide the production process of in-game areas (see Figure 12). Additionally, I made a list of the objectives required to complete the game alongside a map with numbers indicating where each objective is.

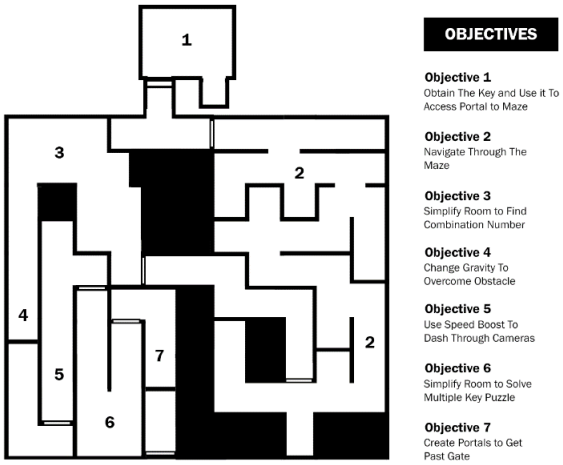

Figure 12. Entire game map with objectives and indicators.

4.3. Production

Creating 3D Models, Textures, and Shaders

Taking the unique elements present throughout art styles into consideration, it became evident to me that each would require different strategies to be recreated in the Unity engine. For instance, replicating the aesthetic of *SUPERHOT* would require the development of low-poly models and white textures to ensure a minimalistic design, while stylised and photorealistic objects could vary less significantly in terms of overall model detail (McLaughlin, 2010). However, *Jet Set Radio* contains stylised models that use cel-shading with outlines and flat colouring (Järvinen, 2002), which is why replicating that look required the development of a new shader that could support those elements.

To successfully model the assets, I used Autodesk Maya for objects and the Unity ProBuilder tool for the process of modelling empty rooms (see Figure 13). This was not initially planned, but experimentation proved to be beneficial, as it meant that rooms could be modified quickly in the engine. The overall level design and structure also notably changed, as the initial plan was to feature three mazes with different layouts and mechanics in each, and then have the player navigate through them in a set order without the ability to change the environment to overcome obstacles. However, the idea of changing environments in real-time as a core mechanic seemed more fitting in the context of controlling elements of dreams to solve problems, so the game was modified to have one maze as opposed to three. After creating a maze layout, I created textures using Materialize and Adobe Photoshop, although some had to be obtained online due to time constraints. Textures were then turned into materials in the Unity engine and applied to models to highlight colours or surfaces such as wood and metal, with the exception of simplified assets which stayed white or red. To ensure that photorealistic models could maintain a lifelike appearance, I produced additional texture maps that emphasised shadows, displacement, and light depth.

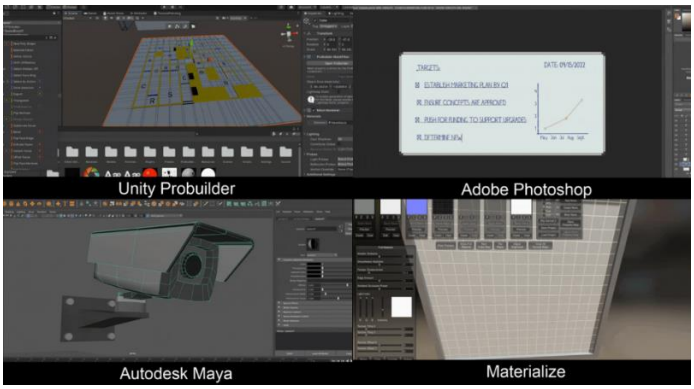

Figure 13. Adobe Photoshop, Autodesk Maya, Materialize, and Unity were used to create artistic assets.

In *The Maze of Nightmares*, players can change the environment's overall visual style at the press of a button, which, in turn, can change what objects are present in rooms, offering new affordances (see Figure 14). This ability can only be activated when confronted with an obstacle, such as a gate, a security camera, or a locked door. For instance, the player can summon a portal device for teleportation when transforming the photorealistic environment into its stylised variant. I programmed the security camera mechanic to work in a very similar way, but with a clear red light to indicate its limited field of vision. The implementation of lighting and shadows was necessary for achieving the intended art styles, which is why the process of creating various shaders was so essential. I chose the Unity Universal Render Pipeline for this reason, as it natively supports Unity shader graph, a tool that allows developers to design shaders without the need for traditional text-based coding, as visual graphs with nodes are used to simplify the process (see Figure 15). The tool helped me to create a cel-shader for stylised assets, as well as certain special effects used and featured throughout the prototype, such as the portal object (see Figure 14).

Figure 14. A comparison of the break room rendered in different art styles.

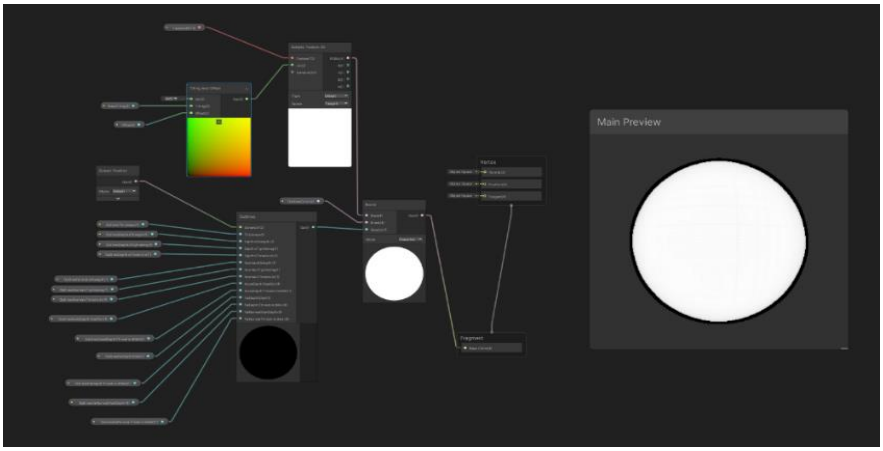

Figure 15. The finished result of the cel-shader created with the shader graph tool in the Unity engine.

Programming

As the artistic artefact was developed in Unity, I made the C# scripts in Microsoft Visual Studio, which allowed me to develop the interactive

elements and ensure that the mechanics worked as intended. The built-in tools featured in the Unity engine simplified certain aspects of development, such as object collisions, audio components, and rendering pipelines. All the game's most advanced features relied on effective programming to work as intended, such as coroutines functions to ensure correct timing in events. The ability to disable and enable objects through scripts was necessary to ensure players could switch between art styles (see Figure 16).

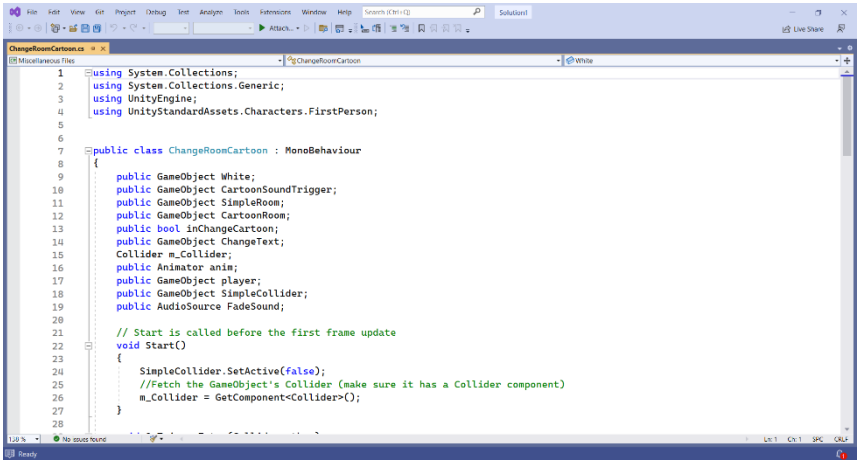

Figure 16. C# scripts made with Microsoft Visual Studio were used to switch assets between art styles.

4.4. Post-Production

Applying Post-Processing Effects to Improve Visuals

The application of post-processing involves the use of filters and effects as an overlay to improve visuals (Magdics et al., 2013). I applied several post-processing effects through the Unity engine to improve the visual quality of areas featured in the game (see Figure 17). Through post-processing options, I was able to make adjustments in areas such as contrast, exposure, and colour intensity to modify the clarity and sharpness of the lighting, 3D models, and materials. The outlines were also added in through post-processing, allowing stylised assets to maintain a visual appearance reminiscent of cartoons and comic books. In addition to the visual changes, motion blur was implemented to make the movement feel more surreal, as doing so helped to contribute to the overall dreamlike atmosphere I was going for.

Figure 17. A comparison of the break room environment early on in development (left) and an updated one with post-processing effects applied (right).

5. Practical Review

In relation to the discussed theory that games as a medium can combine visual elements and creative expression to examine real-world topics, I would now like to briefly explain how *The Maze of Nightmares* aims to do so. This self-produced game was intentionally designed to feature traits associated with art games, as a combination of creative expression and visual elements are featured in a virtual environment. The experience emphasises communication through a narrative where the context of a dream is used to help overcome subconscious fears of change. Photorealistic, simplified, and stylised art styles are incorporated intentionally for artistic purposes and serve as visual indicators that environments and objects can change in a dream. By using the concept of escaping a dream as a narrative tool, the idea of the protagonist taking control and using the power of changing elements to solve problems becomes plausible.

I strongly believe that *The Maze of Nightmares* succeeds in its goal of using a combination of mechanics, art styles, and narrative elements to allow for an experience in which creative expression is emphasised. For instance, the concept of a maze is used to symbolise uncertainty, while also presenting itself as a problem to be solved. Obstacles are also utilised as a metaphor, as well as used as a narrative tool for confronting a challenge. This is done for the purpose of represent the confusing feelings of inner conflict that can come with confronting feelings and doubts. The ability to be in control in this context by adapting to the situation is then used to highlight that embracing change can allow for solutions and new possibilities.

6. Conclusion

Upon analysing existing case studies and prior research, it is evident that games with visual elements feature unique attributes and characteristics which can be classified by art style. These characteristics range from a variety of factors, such as the overall amount of detail and complexity present in models and textures, how colour and lighting are used in combination with shading, and even the influence of effects such as exaggerated features and outlines. Furthermore, the choice of an art

style can provide game developers with different advantages when trying to express creative ideas, such as how embracing a simplified aesthetic with minimal details can potentially amplify a core message, preventing distractions from a narrative.

This is showcased in *The Maze of Nightmares*, as the game uses the idea of switching between art styles to highlight the differences between them and reinforce the concept of change, as well as uses creative expression to highlight how taking action by trying new things can potentially solve problems. By doing so, an element of emotional resonance and social commentary on how people who resign themselves to unhappy, daily cycles is present in the game. Communication is an essential aspect of understanding both art and video games, which is why the application of an art style and what it is used for can be relevant and important.

By defining these art styles and highlighting the differences between them, I believe that my research, as well as my practical component, show that each style contains unique elements that can be helpful in reinforcing a game's overall message or theme. I believe that the idea that art styles can make such an impact can be reinforced upon examining other case studies that leverage them to amplify a narrative. Art styles that stray from photorealism, for instance, can work well with games that embrace concepts that feature exaggerated or simplified elements, as they can do so without looking unnatural. *Jet Set Radio* is a notable example of this, particularly in its use of vibrant cel-shaded visuals to contribute to the game's rebellious and energetic atmosphere. The game also contains various instances of exaggerated elements in the form of characters and actions that could be seen as flamboyant and audacious, further emphasising the point that non-realistic visuals can also allow for more imaginative settings and concepts, as they are not required to abide by conventional standards of reality (Järvinen, 2002). Using *The Maze of Nightmares* as an example, players can generate fantastical devices such as portals and gravity changing pads when switching the environment from its standard realistic look to a stylised cartoon. In doing so, this also reinforces the dream-like theme of the game, as well as highlights the benefits of change. As a result, *The Maze of Nightmares* demonstrates how visual elements can influence affordances, creative expression, and overall gameplay.

Acknowledgments

Words cannot express my deepest appreciation and gratitude with regards to the support I received throughout my master's. I am extremely grateful for the consistent guidance I received from my supervisor, Christopher Rhodes, without whom this project would not have been possible. I am also incredibly thankful for the assistance and encouragement I received from my Specialist Study Skills Tutors, Sophie Pullen and Amy Trott, alongside the advice, feedback, and support from

Bruno De Paula, Brigitta Zics, Andrew Burn, and Veysel Apaydin. On top of the support received for the theoretical aspect of my work, I also want to thank Abel Drew for his direct assistance throughout the process of developing my practical artefact—his expertise solved my programming issues on several occasions. Lastly, I would like to extend my deepest appreciation to my family, who were there to support me throughout the development of this project. In particular, I am grateful for the continuous support and guidance I received from my mother and older brother.

References

Andriessen, C. (2018, February 21). *Review:* Final Fantasy XV: Pocket Edition. Destructoid. https://www.destructoid.com/reviews/review-final-fantasy-xv-pocket-edition/

AtariAge. (n.d.). *International Soccer—M Network—Atari 2600*. https://atariage.com/screenshot_page.php?SoftwareLabelID=249

Bourgonjon, J., Vandermeersche, G., Rutten, K., & Quinten, N. (2017). Perspectives on video games as art. *CLCWeb: Comparative Literature and Culture, 19*(4). http://docs.lib.purdue.edu/clcweb/vol19/iss4/1

Brown, D. (2016). *The suspension of disbelief in videogames* [Doctoral dissertation, Brunel University]. Brunel University Research Archive. http://bura.brunel.ac.uk/handle/2438/7457

Cardona-Rivera, R. E., & Young, R. M. (2013). A cognitivist theory of affordances for games. *Proceedings of DiGRA 2013: DeFragging Game Studies*. http://www.digra.org/wp-content/uploads/digital-library/paper_74b.pdf.pdf

Colwander, M. (2022, February 22). *10 games that have different names in different regions*. CBR. https://www.cbr.com/games-different-names-different-regions/

Cho, H., Donovan, A., & Lee, J. H. (2018). Art in an algorithm: Taxonomy for video game visual styles. *Journal of the Association for Information Science and Technology*, *69*, 633–646. https://doi.org/10.1002/asi.23988

Galactic Café. (2013). *The Stanley parable* [Multiple platforms]. Galactic Café.

Dinur, E. (2021). *The complete guide to photorealism for visual effects, visualization and games*. Routledge.

Edery, D., & Mollick, E. (2008). *Changing the game: How video games are transforming the future of business*. FT Press.

Epic Games. (2017). *Fortnite* [Multiple platforms]. Epic Games.

Flanagan, M. (2009). *Critical play: Radical game design*. MIT Press.

Fullerton, T. (2014). *Game design workshop: A playcentric approach to creating innovative games*. CRC Press.

Bellingham, H. (2022, June 23). *The new* Minecraft *update can totally ban you from all online play*. GamesRadar+. https://www.gamesradar.com/minecraft-1191-pre-release/

Gooch, B., & Gooch, A. (2001). Non-photorealistic rendering. AK Peters/CRC Press. https://doi.org/10.1201/9781439864173

Good, O. S. (2017, April 17). *Good news:* Grand Theft Auto 5 *is being used to train driverless cars.* Polygon. https://www.polygon.com/2017/4/17/15328268/grand-theft-auto-5-driverless-cars-research

Gotanda, Y. (2010, July). Film simulation for video games [Conference presentation]. SIGGRAPH 2010: 37th Annual Conference on Computer Graphics and Interactive Techniques, Los Angeles, CA, United States.

Hanson, C. (2018). *Game time: Understanding temporality in video games*. Indiana University Press.

Hergaarden, M. (2011). *Graphics shaders*. AK Peters/CRC Press.

Hölttä, L. (2018). *Effects of art styles on video game narratives* [Master's thesis, University of Turku]. UTUPub. https://urn.fi/URN:NBN:fi-fe2018091335588

Imms, J. (2016, December 3). Lara Croft GO *coming to PS4 and Vita [UPDATE].* GameSpot. https://www.gamespot.com/articles/lara-croft-go-coming-to-ps4-and-vita-update/1100-6445864/

Järvinen, A. (2002). Gran stylissimo: The audiovisual elements and styles in computer and video games. In F. Mäyrä (Ed.), *Proceedings of Computer Games and Digital Cultures Conference* (pp. 113–128). Tampere University Press.

Jarvis, N. (2013). *Photorealism versus non-photorealism: Art styles in computer games and the default bias* [Master's thesis, University of Huddersfield]. Huddersfield Repository. http://eprints.hud.ac.uk/id/eprint/19756/

Keating, S., Lee, W. C., Travis, W., & Jin Ha, L. (2017). The style of *Tetris* is… Possibly *Tetris*? Creative professionals' description of video game visual styles. *Proceedings of the 50th Hawaii International Conference on System Sciences*, 2046–2055. http://hdl.handle.net/10125/41402

Kollar, P. (2013, October 13). *The* Stanley Parable *review: The soul of wit*. Polygon. https://www.polygon.com/2013/10/17/4849998/stanley-parable-review

Koster, R. (2004). *A theory of fun for game design*. O'Reilly Media.

Lankes, M. (2020). Social gaze in minimalist games. *CHI PLAY '20: Proceedings of the Annual Symposium on Computer-Human Interaction in Play*, 450–460. https://doi.org/10.1145/3410404.3414265

Lee, B. (n.d.). *1920x1080* Jet set radio *HD desktop background.* Coolwallpapers. Accessed November 15, 2023. https://coolwallpapers.me/5438233-jet-set-radio-hd-background-hd.html

Lemyre, A., Légaré-Bergeron, L., Landry, R., Garon, D., & Vallières, A. (2020). High-Level Control in Lucid Dreams. Imagination, Cognition and Personality, 40(1), 20-42. https://doi.org/10.1177/0276236620909544

Liapis, A., Yannakakis, G., & Togelius, J. (2021). Designer modelling for personalized game content creation tools. *Proceedings of the AAAI Conference on Artificial Intelligence and Interactive Digital Entertainment*, *9*(2), 11–16. https://doi.org/10.1609/aiide.v9i2.12587

Lohrenz, L. J. (2019, June 4). *Comparing the* FF7 *remake character designs vs the original* Final Fantasy VII. IGN Africa. https://za.ign.com/final-fantasy-vii-remake/132918/feature/comparing-the-ff7-remake-character-designs-vs-the-original-final-fantasy-vii

M Network (1980). *International soccer* [Atari 2600]. Mattel Electronics.

MacLeod, R. (2021, June 8). *Superman,* Rick and Morty *Headline* Fortnite*'s New Battle Pass.* Kotaku. https://kotaku.com/superman-rick-and-morty-headline-fortnites-new-battle-1847054167

Madeja, S. (1983). Computer graphics: The new subject matter for the art curriculum. *Art Education*, *36*(3), 15–17.

Malzbender, T., Gelb, D., & Wolters, H. (2001). Polynomial texture maps*. Proceedings of the 28th Annual Conference on Computer Graphics and Interactive Techniques*, 519–528. https://doi.org/10.1145/383259.383320

Manning, A. (1998). Understanding Comics: The Invisible Art. *IEEE Transactions on Professional Communication*, *41*, 66–69. https ://doi.org/10.1109/TPC.1998.661632

Magdics, M., Sauvaget, C., García, R.J., & Sbert, M. (2013). Post-processing NPR effects for video games*. Proceedings of the 12th ACM SIGGRAPH International Conference on Virtual-Reality Continuum and*

Its Applications in Industry, 147–156. https://doi.org/10.1145/2534329.2534348

McLaughlin, T., Smith, D., & Brown, I. (2010). A framework for evidence-based visual style development for serious games. *Proceedings of the 5th International Conference on the Foundations of Digital Games*, 132–138. https://doi.org/10.1145/1822348.1822366

Metro. (2015). The history of Racing Games, part 1 – reader's feature. Metro. Retrieved from https://metro.co.uk/2015/05/30/the-history-of-racing-games-part-1-readers-feature-5221628/

Mojang Studios. (2011). *Minecraft* [Multiple platforms]. Mojang Studios.

Morales, M. (2018). *Concerning virtual reality and corporealized media: Exploring video game aesthetics and phenomenology* [Master's thesis, University of South Florida]. Digital Commons. https://digitalcommons.usf.edu/etd/7343/

Namco. (1982). *Pole position* [Arcade]. Namco.

Naughty Dog. (2020). *The last of us part II* [PlayStation 4]. Sony Interactive Entertainment.

Nealen, A., Saltsman, A., & Boxerman, E. (2011). Towards minimalist game design. *Proceedings of the 6th International Conference on Foundations of Digital Games*, 38–45. https://doi.org/10.1145/2159365.2159371

Nintendo EPD. (2017). *The legend of Zelda: Breath of the wild* [Nintendo Switch]. Nintendo.

Nintendo EAD. (2002). *The legend of Zelda: The wind waker* [GameCube]. Nintendo.

Bandai Namco Studios. (2018). *Super smash bros ultimate* [Nintendo Switch]. Nintendo.

Obendorf, H. (2009). *Minimalism: Designing simplicity*. Springer.

Omernick, M. (2004). *Creating the art of the game*. New Riders.

Parker, F. (2012). *An art world for artgames*. *Loading: The Journal of the Canadian Game Studies Association*, *6*(9), 18–31. https://journals.sfu.ca/loading/index.php/loading/article/view/119

Pearce, C. (2006) Games as art: The aesthetics of play. *Visible Language*, *40*(1), 67–89. https ://journals.uc.edu/index.php/vl/article/view/5777

Philip, R. (2013, May 26). *Mind blown: Video games graphics evolution in the last 30 years* [p. 57]. GamingBolt. https://gamingbolt.com/mind-blown-video-games-graphics-evolution-in-the-last-30-years/57

PlayStation. (n.d.). *SUPERHOT*. Accessed November 15, 2023. https://store.playstation.com/en-gb/product/EP2477-CUSA08144_00-EUSUPERHOTGAME00

Pötzsch H: Games and Realism. In: Grabarczyk P. EoLT: Encyclopedia of Ludic Terms, 2022. ERC-Advanced-Grant project MSG – Making Sense of Games.

Power, P. (2009). Animated expressions: Expressive style in 3D computer graphic narrative animation. *Animation*, *4*(2), 107–129. https://doi.org/10.1177/1746847709104643

Power, P. (2012). Ludic toons: The dynamics of creative play in studio animation. American Journal of Play, 5(1), 22–54. https://eric.ed.gov/?id=EJ985603

Purnomo, S. L. A., Untari, L., Purnama, S. L., Asiyah, N., Umam, R., Sartika, Y., ... Inderasari, E. (2021). Ludic Adaptation: Can We Babyfy, Chibify, Bambify, or Cherubify a Literary Text for Younger Audiences? Gema Online® Journal of Language Studies, 21, 89-109. https://doi.org/10.17576/gema-2021-2101-06

Rare Gallery. (n.d.). *4K, Ellie,* The Last of Us 2*, trunk tree, guitar, sitting, HD wallpaper*. Accessed November 15, 2023. https://rare-gallery.com/877286-ellie-the-last-of-us-2-trunk-tree-guitar-sitting.html

Rhodes, G., Brennan, S. E., & Carey, S. (1987). Identification and ratings of caricatures: Implications for mental representations of faces. *Cognitive Psychology*, *19*(4), 473–497. https://doi.org/10.1016/0010-0285(87)90016-8

Rockstar North. (2013). *Grand theft auto V* [Multiple platforms]. Rockstar Games.

Rockstar Studios. (2018). *Red dead redemption 2* [Multiple platforms]. Rockstar Games.

Sarver, E. (2021). *The impact of art style on video games* [Bachelor's thesis, University of Central Florida]. STARS. https://stars.library.ucf.edu/honorstheses/875/

Smilebit. (2000). *Jet set radio* [Sega Dreamcast]. Sega.

Shon, Y., & Seo, Y. (2005). The study on the exaggeration of the human body in fashion illustrations. *Proceedings of the Costume Culture Conference*, 142–144. https://koreascience.kr/article/CFKO200536036092334.pdf

Sirani, J. (2020, July 9). Superhot*: Mind control delete announced, free for those who bought* Superhot*.* IGN Africa. Retrieved from https://za.ign.com/superhot-mind-control-delete/145277/news/superhot-mind-control-delete-announced-free-for-those-who-bought-superhot

Spahn, M. Kafka K. & Hochschule Darmstadt Fachbereich Media. (2021). *Game design and affordance theory benefits of user experience design methods for communicating and supporting gameplay through visual design of game objects* [dissertation, Hochschule Darmstadt]. https://search.worldcat.org/title/1336537781

Square Enix Montreal. (2015). *Lara croft go* [Multiple platforms]. Square Enix Montreal.

Square. (1997). *Final fantasy VII* [PlayStation]. Square Enix.

Square Enix. (2005). *Kingdom hearts II* [PlayStation 2]. Square Enix.

Square Enix. (2016). *Final fantasy XV* [Multiple platforms]. Square Enix.

Fandom. (n.d.). *Stanley (canon,* The Stanley Parable*).* https://character-stats-and-profiles.fandom.com/wiki/Stanley_(Canon,_The_Stanley_Parable)

Sundkvist, N. (2022). *How to enhance your game with visual style choices* [Bachelor's thesis, Metropolia University of Applied Science]. https://www.theseus.fi/bitstream/handle/10024/753398/Sundkvist_Nathan.pdf?sequence=2&isAllowed=y.

SUPERHOT Team. (2016). *SUPERHOT* [Multiple platforms]. SUPERHOT Team.

Tailford, S. (2018, February 1). Red Dead Redemption 2*: 7 new screenshots you need to see*. WhatCulture. https://whatculture.com/gaming/red-dead-redemption-2-7-new-screenshots-you-need-to-see

Samuraisaac. (2021, May). *What Does Breath of the Wild Look Like Without Cel Shading?* [Video]. YouTube. https://www.youtube.com/watch?v=7YaO8iArnCQ

SUPERHOT [SUPERHOTTHEGAME]. (2020, November 26). *Hey! Anyone in need of SUPERHOT zoom/meet backgrounds? ;)* [Tweet; images]. Twitter. https://twitter.com/SUPERHOTthegame/status/1331977899990200320

UN JE NE SAIS QUOI. (2023). *Dordogne* [Multiple platforms]. UN JE NE SAIS QUOI.

Steam. (n.d.). *Jet Set Radio*. Accessed November 15, 2023. https://store.steampowered.com/app/205950/Jet_Set_Radio/

Wattanasoontorn, V., Theppaitoon, M., & Bernik, A. (2019). *A classification of visual style for 3D games. Proceedings of the 2019 16th International Joint Conference on Computer Science and Software Engineering*. https://doi.org/10.1109/JCSSE.2019.8864219

Webster, A. (2020, May 6). *The hand-painted beauty of indie game* Dordogne*.* The Verge. https://www.theverge.com/2020/5/6/21249119/dordogne-indie-game-interview-steam-nintendo-switch

Wu, Y. (2012). *The style of video games graphics: Analyzing the functions of visual styles in storytelling and gameplay in video games* [Master's thesis, Simon Fraser University]. Summit Research Repository. https://summit.sfu.ca/item/12529

Zell, E., Zibrek, K., & McDonnell, R. (2019). Perception of virtual characters. *ACM SIGGRAPH 2019*, 1-17. https://doi.org/10.1145/3305366.3328101