University of Gothenburg

Assignment 3

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1 Introduction

For this Assignment two computer-based are analysed and compared. One is the arcade game Frogger[1] from 1981, the other is Super Mario Odyssey[2], released for the Nintendo Switch[3] in 2017. The games will be analysed discussing the following questions:

- RQ1: How does the technological affordances and constraints of the platform define the games?
- RQ2: What features of the games identify them as examples of specific genres? Are these features inherent to the games or external?
- RQ3: How is space and time constructed in the games?
- RQ4: How does the audiovisual design provide cues for interaction or help understand what is going on in the games?

For discussing the gameplay design pattern will be used as defined by Staffan Björk, Sus Lundgren and Jussi Holopainen[4]. Patterns will be marked as *Pattern*. The term player-character is used as defined by Daniel Vella[5]. Throughout the discussion I will make you use reward concepts as they are discussed by Alison Gazzard[6]. When using these reward concepts they are marked as **reward**.

2 Description

2.1 Frogger (Arcade - 1981)

Throughout the years multiple versions of the game Frogger were released. In this assignment the arcade game Frogger released in the year 1981 is discussed. As the original arcade machine could not be accessed, the game was experienced in an emulator played on a computer with a keyboard. The emulator used can be found ClassicReload[1]. The arcade game Frogger is an *Unwinnable*[7] *Real-Time Game*[8]. The player has to insert coins into the arcade machine to play the game. The game consists of multiple *Levels*[9]. In every *Level*[9] it is the goal to navigate five frogs to five frog homes. To reach the frog homes the frogs have to first be navigated across a busy road and afterwards across a river with turtles and floating logs serving as platforms. When this goal is reached the player proceeds to the next *Level*[9]. New *Levels*[9] reached change the speed, at which the hazards and platforms move, and sometimes introduce new obstacles to overcome, e.g. alligators in the river area, which serve as hazard and platforms at the same time. While doing this the player is earning points. Points can be earned by multiple means, e.g. for navigating a frog to a frog home, with the player earning more points the less time he needs, for successfully finishing a level or collecting flies, that can sometimes be found in the frog homes. The player has three *Lives*[10]. These *Lives*[10] can be lost under a multitude of circumstances, e.g. a frog gets hit by a car on the road section, the frog missing a platform on the river section or a frog not reaching the frog home within a certain *Time Limit*. When all three *Lives*[10] are lost the game session is over and all progress is lost. At *Game Over*[11] the player's score is listed in a *High Score List*[12].

2.2 Super Mario Odyssey™ (Nintendo Switch™ - 2017)

Super Mario Odyssey[2] is a *Real-Time* 3D platform game, released for the Nintendo Switch[3] in 2017. The game follows a story. To advance in the story the player-character discovers and explores[13] different regions of the game world[14]. During the story the player-character has to collect a certain amount of moons in one region to proceed to the next region. The player can also collect different currencies (coins available throughout the whole game world and region specific currencies), with which the player-character can purchase new costumes and souvenirs specific to the regions, which mostly serve as **rewards of glory** and initiators for **social rewards**. The player-character can interact with the game world in many different ways, but most importantly the player-character has different means of jumping and can take control of *NPCs*[15] and use the *NPC's*[15] abilities[16] to explore[13] the game world[14] in different ways. After the story is completed, the player-character can keep exploring[13] the previously unlocked regions, as the regions contain more moons to collect than the player needs to proceed in the story, and even explore further new regions.

3 Analysis

3.1 RQ1: Platform defining the game

3.1.1 Frogger

As I only experienced playing Frogger on an emulator and I don't know specifics of the hardware used in the original arcade, I can only make assumptions based on my general knowledge of technology of that time. The audiovisual possibilities were very limited on computers in 1981, which results in Frogger only having sounds for a few game elements and actions apart from the melody playing in the background and the visuals consisting of roughly pixelated graphics, which are very limit in regards of colour variety, when compared to today's standards. The hardware limitations most likely also resulted in the rather slow game and animation speed. The arcade game Frogger is played with a joystick and does not allow diagonal inputs, which translated well to the controls via the directional keys on a keyboard when, when playing Frogger on an emulator on a computer. Another limitation of the platform is, that the two player-mode is limited to the players taking alternating turns[17], due to there only being one joystick on the original arcade machine. The arcade machine as a platform also required the player to input coins to play, which is also defining for the game, as Frogger, as well as many arcade games, relies on rewards of sustenance to let the player play longer if the player performs well in the game. The coin input is simulated in the emulator by pressing a key.

3.1.2 Super Mario Odyssey™

Super Mario Odyssey is only available on one platform, which is the Nintendo Switch. While the Nintendo Switch's hardware is also relatively limited compared to other home consoles, due to it designed to also be usable as a handheld console, it is still very powerful when compared to hardware from 1981, enabling e.g. having 3D graphics and perspective projection[18]. However I would argue, that the audiovisual design was not strongly defined by the platforms limitations or affordances, as the game is not aiming for a realistic look, that would benefit greatly from more computing power. The Nintendo Switch offers many control options, like having the Joy-Cons[19] seperated, having the Joy-Cons[19] attached to the system or playing with a Nintendo Switch Pro-Controller[20]. While many games only allow some control options Super Mario Odyssey enables the player to choose any controller configuration, but it is recommended to play with the two Joy-Cons[19] detached, one in each hand. This shall make it easier to use the motion controls, enabled by the use of sensors in the Joy-Cons[19], which are used to perform some of the player-character's *Abilities*[16], e.g. fast climbing or spinning the player-character's hat around the player-character. I would also say that the game benefits from the Switch's portability, as this makes it easier for players to share their experiences with other players. The same goes for the ability provided to the user by the platform to take screenshots and to share them on social media.

3.2 RQ2: Features

3.2.1 Frogger

In Frogger the player's score is listed in a *High Score List*[12]. This serves as a **social reward** or **reward of glory**. It is a feature inherent to the game and is a feature often found in arcade games. Also common in arcade games, is having to input coins, as money often equals time in arcade games. In that case it can be perceived as a **reward of time**, that the player has to put less money in the arcade machine. The player having to navigate the frogs to avoid hazards and especially using the floating platforms on the river part of the levels is a feature, which is typical for platform action games. However the top-down view of the game is untypical for a platform game, as 2D platforming games are usually side-scrolling[18].

3.2.2 Super Mario Odyssey™

In Super Mario Odyssey navigation[21] through the *Game World*[14] is a constantly important feature. This is a typical feature for platform games, but also for racing or first-person shooter games. Also I would argue that Super Mario Odyssey provides good learnability, as throughout the different regions new *Abilities*[16] are introduced over time. The player is also given obstacles and time to master those *Abilities*[16] before the next *Abilities*[16]. Good learnability is also defining of platform games. I would also argue that variety in movement options, especially regarding jumps is also defining for platform games. In Super Mario Odyssey the the player-character has different jump options at his disposal, e.g. long jumps, high jumps and wall jump. These movement options get even more variation through the player-characters ability to take over *NPCs*[15]. This results in **spatial rewards**, which are inherent to 3D platform games. Another inherent feature, which is typical for 3D platform games, is that the player has many means of exploring[13] the *Game World*, which leads to the player being able to set *Player-Defined Goals*[22] as he can often choose to follow the story or explore[13] one of the unlocked regions in various ways. Super Mario Odyssey also provides some puzzles and includes story telling, as there is an story told why the player-character is exploring[13] the *Game World*[14]. These features are typically defining for adventure games. **Social rewards** are also available in Super Mario Odyssey, e.g. through the collectible moons, but they are less inherent to the game than in Frogger.

3.3 RQ3: Space and time

3.3.1 Frogger

As Frogger is an arcade game, players usually have to insert coins into to the arcade machine to play. For arcades that typically means that the more money the player spends on the game the longer he can play. This is true for Frogger, but instead of extending the players game session, by e.g. restoring or granting a *Live*[10], this only allows the player to play more sessions. When the player is able to successfully navigate a frog to an unoccupied frog home within a certain *Time Limit*[23] the player is rewarded with

not losing a *Live*[10]. This could be perceived as a **false reward** as it at first glance just prevents the player from death and therefore from reaching an early *Game Over*[11] state. However I would argue that this is a **reward of time**, because it extends the time of the player's game session as the player's game session would otherwise be limited to a maximum of three times the *Time Limit*[23]. Also it serves as a prerequisite to a **reward of exploration**, as the player can unlock a new *Levels*[9] when he manages to navigate five frogs to the five frog homes in one *Level*[9].

Frogger has multiple *Levels*[9]. Every *Level*[9] is contained in one screen and has the same basic layout with the bottom half displaying a street and the upper half of the screen displaying a river. Although the basic layout is the same for every *Level*[9], the player receives **rewards of exploration** when unlocking a new *Level*[9], as the speed in which the obstacles and platforms are moving is changing and new types of obstacles are added especially during the first couple of *Levels*[9], e.g. while the first *Level*[9] only features logs and turtles as moving platforms in the river area, the second *Level*[9] introduces alligators which act as platform and hazard at the same time. The *Game World*[14] is presented from a top-down view with parallel projection. Other than a perspective projection, which is often used to simulated a gaze turned on the game world, the parallel projection is closer to the spatial structure of the objects[18] and is used to give the player a feeling of the actual sizes of the hazards and platforms, which makes it easier to navigate the frog for the player as it allows more precision. This also makes it easier to see the distances between the hazards/platforms and to get a feeling for their movement speed. This is complimented by the top-down view and the fact that the whole level is contained in one screen, as this gives the player a constant overview of the level to navigate through. The top-down view also results in the X-Y surface space being transposed into an X-Z diegetic space[18]. It may seem as if the Y-axis is not present in the gameplay, but I would argue that there is an implicitly used Y-axis, e.g. some turtles dive underneath the water in the river.

3.3.2 Super Mario Odyssey™

In Super Mario Odyssey the player's game session is, unlike Frogger, usually not constraint in time. The only exception I can see for that would be if the game is played on the switch in handheld mode without any possibility to charge the battery. In this case the game session would be restricted in length by the system's battery run-time. However it is possible for the player to be set back to the last *Check Point*[24], when losing all of his *Lives*[10], therefore losing progress[25]. There are multiple items to restore *Lives*[10] or temporarily increase the maximum amount of *Lives*[10] acting as **rewards of sustenance** or **rewards of regeneration**, increasing the time before the next death. Additionally there are some parts in the game where there is only limited time for the player to reach a certain goal, e.g. racing events where the player-character has to cover a certain track faster than the *NPC*[15] competition or events where the player-character has to reach a certain place before a *Time Limit*[23] is up.

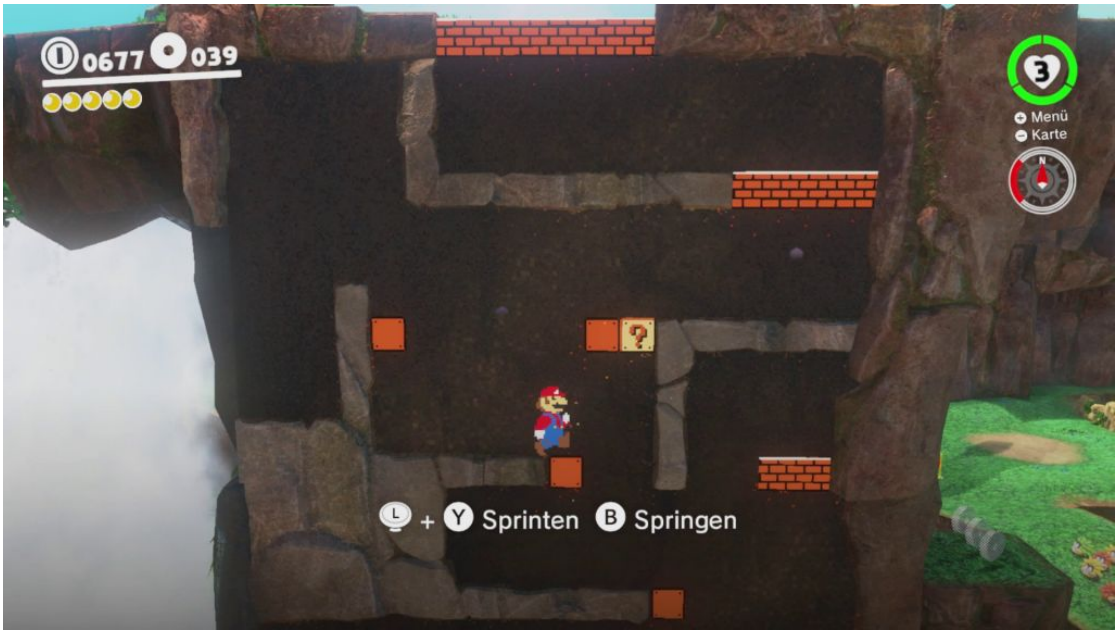

Figure 3.1: Screenshot from Super Mario Odyssey™, showing the player-character being projected as a 2D element on a surface in the 3D world. Source: `https://img.gameswelt.de/public/images/201710/87aed2aea506f66eed5a6bb6575e322f.jpg`

The game world in Super Mario Odyssey is separated in multiple enclosed regions. These regions have to be unlocked by collecting moons in the different regions. In this case these moons, which also act as **rewards of glory** and **social rewards**, act as **rewards of exploration** as they grant access to new regions in the *Game World*[14]. Other sources for **rewards of exploration** are the player-characters ability to take-over *NPCs* [15], which grants the player-character new movement options and therefore new means to explore[13] the *Game World*[14], and the ability to change clothes, as the player-character is only granted access to certain sections of the *Game World*[14] when wearing specific clothes. This can be translated to the collectible currencies, which can easily be perceived as only **rewards of glory** or **social rewards**, serving as **rewards of exploration**, as they are needed to purchase clothing, which in some cases grant access to new sections. The player views the *Game World*[14] through perspective projection[18], with the player-character always in the player's field of view. This view simulates the gaze on the game world the player would have if he was in the game world. It is hard to say, which axis of the game world is projected on which axis on the surface space, as the camera angle is changing through out the game and player is usually able to shift the camera angle. However there are sections in the game, in which the player-character is translated to a 2D figure and is traversing a 2D platforming level, which is projected onto a surface in the 3D game world. In this case the camera is always positioned in an angle to the surface, which the player-character is currently projected to, which presents the 2D platforming

level as side-scrolling. While the projected 2D elements in these sections are presented as parallel projected, with the diegetic Y-Z space being transposed on X-Y surface space[18], the surface in the game world is still presented in perspective projection, as seen in Figure 3.1.

3.4 RQ4: Audiovisual design

3.4.1 Frogger

In Frogger there are only very few sounds besides the melody playing in the background. This emphasis some of the action on the screen, e.g. fast driving cars on the road section are accompanied by a sound as they pass the screen emphasising their higher movement speed, compared to other cars. Another example of an audiovisual cue given to the player is the sound and the animation which ends on a skull and crossbones, when a frog dies. This shall help signalising the player, that the amount of *Lives*[10] are reduced. Also the game displays a bar at the bottom of the screen, showing the player the remaining time of the *Time Limit*[23].

3.4.2 Super Mario Odyssey™

In Super Mario Odyssey one example for an audiovisual cue is, that during sections where an objective is only available for a limited time there is a constant ticking noise. As the *Time Limit*[23] nears it's end the frequency of the ticking increases and the visual objective changing between being visible and being invisible before disappearing. Items, that can be picked up by the player-character, are displayed hovering above the ground and rotating around their own Y-axis. When the player-character is picking up these items there is a sound played to signalise the player, that he was successful in picking up the item. Another example is the *HUD Interface*[26] displaying a compass, helping the player navigating the player-character through the *Game World*[14], emphasising the importance of *Game World Navigation*[21] and reminding the player constantly of the **rewards of exploration and environment**.

4 Comparison

Both games grant access to **social rewards** by giving the players statistics, which can be compared with other players, namely the scores listed in the *High Score List*[12] in the case of Frogger and the collected moons per region in Super Mario Odyssey. However the gameplay in Frogger revolves more around **rewards of sustenance**, as extending the play time means for the player, that they are getting more for their money and have more opportunities to increase the their score, while the gameplay in Super Mario Odyssey revolves more around **spatial rewards**, as the focus of the game is on collecting moons, which is done by unlocking and exploring[13] the different regions. The time required to do so usually does not play a big role in Super Mario Odyssey, with the exception of some time-based events and *Player-Defined Goals*[22], e.g. a speedrunner trying to

complete the story as fast as possible. The visual presentation of the two games is vastly different, as Frogger is more limited by the hardware and is a 2D game presented in a top-down view parallel projection, while the *Game World*[14] in Super Mario Odyssey is presented with 3D visuals in a perspective projection.

5 References

References

[1] "Frogger." Classic Reload, https://classicreload.com/arcade-frogger.html, visited on 2018-10-16.

[2] "Super mario odyssey™." Nintendo, https://www.nintendo.com/games/detail/super-mario-odyssey-switch, visited on 2018-10-16.

[3] "Nintendo switch™." Nintendo, https://www.nintendo.com/switch/, visited on 2018-10-16.

[4] S. Björk, S. Lundgren, and J. Holopainen, "Game design patterns," *DiGRA '03 - Proceedings of the 2003 DiGRA International Conference: Level Up*, 2003. Volume: 2. ISBN / ISNN: ISSN 2342-9666. http://www.digra.org/digital-library/publications/game-design-patterns/.

[5] D. Vella, "Modeling the semiotic structure of game characters," *DiGRA '14 - Proceedings of the 2014 DiGRA International Conference*, 2014. Volume: 8. ISBN / ISNN: ISSN 2342-9666. http://www.digra.org/digital-library/publications/modeling-the-semiotic-structure-of-game-characters/.

[6] A. Gazzard, "Unlocking the gameworld: The rewards of space and time in videogames," *Game Studies, Volume 11 Issue 1 2011.* http://gamestudies.org/1101/articles/gazzard_alison.

[7] "Unwinnable games." http://virt10.itu.chalmers.se/index.php/Unwinnable_Games, visited on 2018-10-16.

[8] "Real-time games." http://virt10.itu.chalmers.se/index.php/Real-Time_Games, visited on 2018-10-16.

[9] "Levels." http://virt10.itu.chalmers.se/index.php/Levels, visited on 2018-10-16.

[10] "Lives." http://virt10.itu.chalmers.se/index.php/Lives, visited on 2018-10-16.

[11] "Game over." http://virt10.itu.chalmers.se/index.php/Game_Over, visited on 2018-10-16.

[12] "High score lists." http://virt10.itu.chalmers.se/index.php/High_Score_Lists, visited on 2018-10-16.

[13] "Game world exploration." http://virt10.itu.chalmers.se/index.php/Game_World_Exploration, visited on 2018-10-16.

[14] "Game worlds." http://virt10.itu.chalmers.se/index.php/Game_Worlds, visited on 2018-10-16.

[15] "Non-player characters." http://virt10.itu.chalmers.se/index.php/Non-Player_Characters, visited on 2018-10-16.

[16] "Abilities." http://virt10.itu.chalmers.se/index.php/Abilities, visited on 2018-10-16.

[17] "Turn taking." http://virt10.itu.chalmers.se/index.php/Turn_Taking, visited on 2018-10-16.

[18] D. Arsenault and A. Larochelle, "From euclidian space to albertian gaze: Traditions of visual representation in games beyond the surface," *DiGRA '13 - Proceedings of the 2013 DiGRA International Conference: DeFragging Game Studies*, 2014. Volume: 7. ISBN / ISNN: ISSN 2342-9666. http://www.digra.org/digital-library/publications/from-euclidean-space-to-albertian-gaze-traditions-of-visual-representation-in-games-b

[19] "Using the joy-con controllers." Nintendo, https://www.nintendo.co.uk/Support/Nintendo-Switch/Usage/Controllers/Using-the-Joy-Con-controllers/Using-the-Joy-Con-controllers-1198233.html, visited on 2018-10-16.

[20] "Using a nintendo switch pro controller." Nintendo, https://www.nintendo.co.uk/Support/Nintendo-Switch/Usage/Controllers/Using-a-Nintendo-Switch-Pro-Controller/Using-a-Nintendo-Switch-Pro-Controller-1198231.html, visited on 2018-10-16.

[21] "Game world navigation." http://virt10.itu.chalmers.se/index.php/Game_World_Navigation, visited on 2018-10-16.

[22] "Player-defined goals." http://virt10.itu.chalmers.se/index.php/Player-Defined_Goals, visited on 2018-10-16.

[23] "Time limits." http://virt10.itu.chalmers.se/index.php/Time_Limits, visited on 2018-10-16.

[24] "Check points." http://virt10.itu.chalmers.se/index.php/Check_Points, visited on 2018-10-16.

[25] "Death consequences." http://virt10.itu.chalmers.se/index.php/Death_Consequences, visited on 2018-10-16.

[26] "Hud interfaces." http://virt10.itu.chalmers.se/index.php/HUD_Interfaces, visited on 2018-10-16.