Abreham Game Design and Research Document

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1 Introduction

2 Game Overview

2.1 Game Concept

2.2 Genre

The game is a stealth-based game that includes some puzzle and strategy elements to it. The core gameplay revolves around the player moving around the play area in a stealthy manner in order to avoid enemies and achieve objectives.

2.3 Target Audience

The game is created for players aged 12+ as it does contain some violent material and mechanics created for slightly more developed gamers and minds. This being said, the game may still be played by anyone wishing to play a stealth game that is slightly more lighthearted than others.

2.4 Game Flow Summary

The player can move through the game freely as this is an open world exploration stealth game. Although it is free-roam, the player should still be on the lookout and listening for enemies patrolling around the area as they cannot get caught by them. The player may walk, run, or sneak, each resulting in different noise levels created which can be heard by nearby enemies. The player moves around the area with the objective of finding the main road passing by the area in order to escape the area on a truck. The player first needs to escape the circus area into the open forest outside. Whilst in the forest the player must remain undetected by enemies searching the area for them. The player will need to return to the circus every so often to acquire food which serves as energy in the game.

2.5 Look and Feel

The game will be set in a circus and the area surrounding the circus is forest/jungle. The player will be able to hide themselves from enemies in both areas through different means. These areas are used and created in a style that emphasises the games stealth mechanics. The game is set during early parts of the morning where it is still dark and gloomy. The art assets will be created in a cartoony style.

3 Existing Game Analysis

3.1 Mechanics

Research into games which contain mechanics and dynamics similar to this game. This section will analyse the mechanics and level designs of the game *Thief* and *Echo* for the purpose of developing a stealth game.

3.1.1 Echo

Echo, like many other stealth games, uses various mechanics such as movement – to avoid, sneak past or escape an enemy- and combat – to stealthily take down or loudly shoot an enemy - to give players

room to approach clearing levels in different ways.

The design of the levels compliments the movement aspect of the game as it provides different ways to traverse the level, such as simply running through the level, ducking behind or vaulting over obstacles. While there is no verticality in the players movement, it has been used in the level design by creating certain objects or terrain that only allows players to move up/down floors at certain locations of the level and adds to the number of possible paths a player may consider. The combat mechanics are few and quite simple which gives a clear method in removing enemies without being overly complicated to the player. While the methods in which a player kills an enemy are few (stealth take downs or shooting), the level layouts that consist of various rooms, floors and corridors with different obstacles provides players with different perspectives and opportunities to put these methods to use.

The most unique mechanic to Echo, which greatly affects the overall experience in terms of how the level design and mechanics work together, is that the majority of the enemy's actions and abilities are learnt from the player and how the game progresses via this process. The games progression, aside from checkpoints, is split into 5 minute cycles in which enemies record different actions that the player takes and may only use actions that they have recorded in the previous cycle besides basic movement and grabbing the player. This aspect of the game can provide a varied gameplay experience that can push the player to use different methods of clearing a level as enemies will begin to use previously used abilities and tactics.

However, this is only the case if the level itself is carefully designed to cater for different approaches in solving problems. For example, each level has different paths leading to the same goal in which one mechanic will see more use than the other but will subsequently be riskier to use due to the enemy's ability to learn. In Echo's case, a problem arises in that the level design regarding the placement of enemies is not particularly deliberate. Most areas will have more or less the same number of enemies unless they are alerted to the player position and the number of enemies will only increase as more cycles pass by. This makes it harder for players to differentiate the viability between stealth or combat in each level and leads them into sticking whatever play style is more comfortable to the player. It should be noted that while open combat or stealth are choices that the player can make, directly combating enemies has far fewer merits to the player than sneaking. This is due to the fact that shooting in itself attracts more enemies which makes it harder for players to run from as enemies increase in number and also now have the ability to shoot and essentially making the game become an action shooter as opposed to a stealth game. As a result, relying on stealth alone without the shooting mechanic becomes far more viable to players.

This dynamic is created by 2 things, either of which could remedy the problem depending on how it is implemented. The first cause, as mentioned before, is the lack of consideration in enemy placement and their indefinite increase in number as time progresses. The second cause is that while there are different ways to evade or eliminate enemies, there are very few ways to for players to hide from enemies for a long period of time without having to move so that they may analyse their surroundings. Essentially the only method of hiding is to remain out of line of site and as a result, this makes it harder for player to remain undetected and forces them to use more unique actions that only serve to bolster the enemy. On the other hand, it can be argued that adding different methods to hide - such as hiding spots that make the player completely undetectable or tools that cloak the player or blind enemies – makes it too easy to remove an enemies learnt ability as a player can just bide their time till the next cycle via these methods. Echo's problem is that its current implementation via the enemy

cycle learning system presents a problem on the opposite side of the scale in which it is too hard to prevent enemies from using the players abilities in most cycles.

A possible solution would be to change the intervals in which enemies learn the players abilities. Rather than 5-minute cycles, the enemy's behaviour could change per level where each level has different paths that favour certain approaches. It is then up to the player to recognize each path, what mechanic is suitable to that path and how their previous actions that the enemy has learnt has changed that path. In its current state, the games pressure leans more to an action or horror styled game.

3.1.2 Thief

Thiefs mechanics give players a wide range of movement to help them sneak around, above and below enemies in different levels in which viable paths to hide in are usually indicated by shadows. Players can reach their objective by sneaking in the shadows or hiding in certain terrain to avoid enemies, use stealth take downs to eliminate enemies and manipulate light sources and sound to either momentarily increase viable paths to sneak through or manipulate the enemies position. The way in which these mechanics, lighting and level design work together will be discussed below.

Thiefs levels are generally linear in design with only one objective in mind. However, there are at least 3 different paths, with different ways of approaching the path such as patiently observing and sneaking or more riskier running past many enemies after momentarily confusing them, that a player can explore in order to traverse the level and reach the objective. While the overall level is linear, the multiple paths helps keep gameplay flow as players are more likely to encounter a path rather than wandering around aimlessly in a large area looking for only one viable path to the objective. Each type of path in the level is clearly indicated through lighting with risk being directly proportional to the amount of lighting each path has. Furthermore, the paths placement of enemies and distance to the objective helps encourage stealthy game play as the shortest route to the objective is generally quite clear to see but also has the highest concentration of enemies around it with very few hiding spots. This leads the player into the gameplay loops of observe, plan and act where the player can now clearly distinguish dangerous elements, risky paths or choke-points, hiding spots and viable paths via lighting.

While stealthy gameplay that avoids large risks is encouraged by the game, the mechanic of momentarily disabling light sources or causing sound to force enemies to deviate from their post or patrol route gives players a chance to explore more riskier routes with the added tension of time constraints and enemy visibility.

3.2 Art

Research into games which contain the art styles and assets desired for this game.

- **Background of Games:**
  Aragami is a third person stealth RPG, of a ninja assassin who combats with mystical powers to save an imprisoned girl (Steam 2019).While The witness is a first person puzzle game, of an amnesiac character who must complete puzzles to remember why he/she woke up on a beautiful island (Steam 2019).

- **Similarities in the games:**
  Both games are set in outdoors with a heavy emphasis on nature.

Both games make use of low poly objects to create a stylised cartoony feel. However, the objects are not too stylised to the point that they are made of hard edged geometric shapes, as in games like Superhot or Morphite. They are rather made of more organic shapes, but the edges are not as rounded as in real life. This allows the game to maintain some level of realism despite the stylization. The stylization rather emphasises aspects of natures beauty.

3.2.1 Aragami

- **Colour:**
  Aragami makes use of warm and cold colours to communicate and create an atmosphere. Non-interactable objects and backgrounds are made up of cold colours, such as dark blues, greens. These objects include the sky, trees, grass, buildings and rocks.
  Interactable objects, important places, objects leading to and within these places are made up of warm colours. The contrasting colour temperatures cause the warm colours to stand out because they are less prominent than the cold colours and they are brighter.
  This use of colour is meant to guide the player, because warm bright colours draw players' attention. Hence, the player is more likely to go towards them.
  The bright warm colours also create a fantastical visual aesthetic, as it makes objects look like they are glowing. This applies to objects such as blossom trees, which are unrealistically saturated high in low light. This mystical glow emphasises Aragami's magical theme.

- **Light and Shadows:**
  Lights are placed in dark areas also to draw players to them so they can easily maneuver between places. This creates hard shadows to produce a dark game to emphasise the makings of a dark foreground. Apart from attracting players, the game also utilises colourful ambient lighting in important areas, to reinforce its magical theme. Fog is also used to create a mysterious atmosphere, to emphasise the stealth theme.

3.2.2 The Witness

- **Colour:**
  The witness makes use of bright warm colours especially on the flora and fauna. Examples include a forests of bright orange trees and another of bright pink blossom trees which stand out amongst surrounding green flora and fauna.the colours are saturated.

- **Light and Shadows:**
  The matte materials on all the objects give a stylised cartoony feel. Only water is glossy. The witness also makes use of hard shadows, which emphasise the low poly aesthetic, however they are not as dark as those of Aragami.

3.2.3 Other Games Considered

- **Rime**
  Rime is an adventure puzzle video game.The game follows a boy arriving at and searching for a mysterious island with a fox-like spirit as a guide. The player guides the boy in solving environmental puzzles across five large levels.It also uses a stylised cartoony feel. The game uses light in such a way as to try and eliminate the presence of black in the game(Dinneen 2017)

- **Thief and Splinter Cell**
  Both games revolve around a protagonist who maneuver around their given level by being stealthy to complete the objectives of that level. Both games have a highly realistic take on their art style with the objects in the game looking like a real life representation of the object or building. They use dark shades of colour and less light to create shadows and spots where the players can move around without being detected.

- **Deer Hunter**
  Deer hunter is video game based on the simulation of hunting. The player gets to trophy hunt of various animals in their respective habitat. The game sticks to the representation of nature as accurate as possible using natural colours and realistic shapes of the objects found in nature. Deer hunter has a night/ early morning mode where everything is dark, the only source of light tends to be the hunter's car, the moon or the reflection of water.

3.3 Audio

- **Aural game cues:**
  Lets the player be aware of what is happening in their environment/surroundings, as well as creates tension and anticipation through sounds coming from enemies and the surroundings.

- **Feedback:**
  Lets the player know if their action/s have an important impact (win sound or hurt sound etc) and supports the visual parts of storytelling within the game.

- **Setting the mood:**
  Pull the player into the gameplay experience using realistic sounds and reinforces the theme of the game. Ambient sounds from the environment will make the player feel like they are in the actual environment creating emergence.

4 Gameplay and Mechanics

4.1 Gameplay

4.1.1 Game Progression

The player will be set with different objectives along the way to progress the player through the game. The player will initially be introduced to the mechanics of the game through simple task such as interacting with things or going to a specific location. The player will also be forced to accomplish certain objectives due to mechanics like the energy mechanic which will require the player to continually look for food to keep energy levels high. Each of these objectives will offer the player skill points which can be used to learn different abilities to aid in the end goal of the game.

4.1.2 Mission/Challenge Structure

Mission may be played out almost any way the player sees fit but are encouraged to play the game in a stealthy manner as the game becomes even more difficult if not played stealthily. The objectives in the game are relatively simple to accomplish once the challenge of the game is learned and the player begins to adapt. The challenge comes in learning the movement of the enemies in order for the player to make their way around freely and remain undetected. The enemies are created to move in

certain patterns are certain times which can cause the player to have to think on the go. Also, players cant remain hidden forever as there are certain enemies that will search hiding spots for the player, so continuous movement is vital.

4.1.3 Puzzle Structure

The puzzle structure is set up around maneuvering your way through a bunch of enemies and remaining undetected. The game is created to assist the player through the patterns in many ways through audio and visuals. Enemies move in distinct patterns that the player may learn through trial and error methods.

4.1.4 Objectives

The main objective of the game is for the player surviving to escape the circus on a passing truck. Although the game does have a bunch of mini objectives that will assist in the players survivability. Mini objectives will include finding food, to keep energy levels up, searching certain areas for objects or hints, remaining undetected for a certain amount of time etc.

4.1.5 Play Flow

Abreham requires a decent level of concentration but not too much that it begins to agitate the player. Concentration is mainly needed to learn enemy movement pattern. A certain level of skill is required to remain undetected by enemies. The skill comes in the players ability to learn the patterns but also adapt and solve them to move through without being caught. There is also skill in placing a friendly bird character in the right places as it helps to keep that area under surveillance and warn the player should an enemy be in the birds vicinity. The player has control of almost everything in the game once patterns and map are learned. Once learned the game is at the players disposal and they can basically do anything they want without getting caught. The player moves around freely, can distract enemies and also use the assistant bird to aid them along the way. All objective in the game will be clearly set and able to be accomplished. The player is constantly notified of any and all things that are happening to their character through visuals and sound. Damage markers are used for getting shot, heavy breathing for exhaustion, etc, all help in providing feedback to for the player.

4.2 Mechanics

4.2.1 Physics

The world created is intended to be as close to natural as possible. The different floor surfaces make different sounds and at different volume levels, the players movement speed determines how much noise they make, enemies can be heard only within in a certain distance of the player. The players movement is not made to feel like the character being played but are more just for the narrative of the game. When darts are shot by enemies they will move at high speeds to make it more realistic that the player would most probably get hit by them without being able to dodge. The energy mechanic of the game is also there to create a sense of actually losing extra energy while trying to run, hide, and sneak around, and replenishing that energy with food.

4.2.2 Movement in game

Players may move around freely in the game space and have the ability to run as well as sneak. No areas of the game area are out of bounds to allow the player to do as they please and go wherever they choose. The sprint mechanic was introduced mainly to get away from enemies that have detected the player or to get to places faster while the sneak mechanic is to allow the player to remain undetected through sound. The player also has the ability to climb trees which act as hiding spots and hide in large bushes. All of these movements are triggered using a certain key to initiate the desired movement response.

4.2.3 Objects

The objects in the game are food objects which are used to replenish expended energy. Players may pick up and consume these objects once within a certain range of the object and a specific key is pressed to initiate the interaction.

4.2.4 Actions

There are a limited number of actions that the player can do. They can pick up and consume food items, place the bird at a specific point within a certain radius of the player, trigger a sprint or sneak and climb trees and hide in bushes.

4.2.5 Combat

There is no combat system in the game, so the player cannot fight, but the enemies can shoot at the player in certain situations.

4.2.6 Game Options

The player may either play the game completely stealthy or not, but the game does become a lot more difficult playing it non stealth like. The number of enemies spawned increases should the player make too much noise within a certain amount of time, making it more difficult to survive as there are more enemies to detect and shoot at the player. Also making too much noise prevents the player from accomplishing certain objects in that provide adaption points. These adaption points make it easier for the player to escape the area.

4.2.7 Replaying and Saving

Upon replay the only thing that changes to the game is the enemy spawn locations and number of enemies spawned initially.

4.2.8 Cheats and Easter Eggs

5 Story, Setting and Character

5.1 Story and Narrative

The game is based around a circus gorilla named Abreham. While in the circus Abreham makes friends with a bird that comes and visits him often. One day the bird helps Abreham to escape

captivity. It's now up to Abreham to grab this opportunity and escape. After escaping his cage he will have to try and be stealthy and escape the circus, and navigate through the outside world with the aid sounds from his chirping friend. Abreham will have to navigate the unknown world to a safe zone.

5.2 Game World

5.2.1 General look and feel

The game will be partially set in a circus and the bulk of it will be outside the circus, in a jungle where the character will try to navigate to safety. There will be a large emphasis on the jungle's aspects. The player will be able to use the jungle to hide, whilst we use it to hide enemies and other items. We will therefore be using the jungle to emphasise the game's stealth dynamic. The game will be set during morning times between 4am and 6:30am where it still dark and gloomy. The game will use a stylised cartoony feel heavily influenced by the games The Witness and Aragami.

5.2.2 Areas

The game is made up of two main areas, the circus area and the forest. Each area has their own objectives and creative reasons. The forest area is the exploration area used to find the main road in which cars travel. The circus area is used for materials needed for survival, mainly food for energy.

5.3 Characters

- Abreham: A gorilla who was abducted as a baby and raised to perform in the circus. He is gentle, non violent and a scared character. This is due to his treatment at the circus. This escape is the most courageous he's been. Apart from general movement, Abreham can hide, climb up trees and can hear from far distances.
- George: A bird who befriended Abreham in the circus and joins him in his escape. He sits on Abreham's head. He is confident and fearless. Hence, Abreham can call on George to fly ahead of him and hear/see what he can't.
- Butch: An animal control worker looking for Abreham. He is fat wears a khaki shirt and shorts. He is lazy, so he either stands in one place. If he finds Abreham, he can shoot him with his large tranquilliser dart gun.
- Thabo: A circus acrobat looking for Abreham. He is skinny and wears a colourful leotard. He's energetic, so he moves around searching. If he finds Abreham, he can shoot him with his blow darts.

6 Levels

7 Interface

7.1 Visual System

There is minimal use of a HUD. Whether the bird is with the player or not is displayed through an icon on the screen. If the player is hit by a tranquilliser dart, a marker will show up on screen to show the player that they've been hit and what direction the dart came from.

7.2 Control System

The player moves with the traditional WASD system and looks around by the use of a mouse. Interactions will be done by using the E or F keys. The birds placement can be done my right clicking to bring up a cursor for placement and then left clicking to set the marker for the bird to fly to.

7.3 Audio, music, sound effects

7.3.1 Sound Design

For the game the right sounds are needed to support the visual action in the game and sounds which will set the mood and perhaps influence the players emotion.

- Foley Sounds (Realistic subtle sounds) – subtle sounds which would normally convince the listener(player) to believing that they are realistic sound you would expect in real life, such as breathing, footsteps. Such sounds will be used in this game to create a certain level of believability. For designing each sound there must be multiple recorded series (multiple attempts) to have a variety of choice and quality to choose from.

7.3.2 Sound Editing and Mixing

Balance the levels/volume of sounds by equalizing the sounds and removing unwanted frequencies (e.g. background noise). Mixing and putting the Foley sounds together helps us achieve sound effects that are clean and not disrupting to the player.

7.3.3 Usage and Application

Unity Audio Source components are used to achieve realistic sounds within the game.
Audio source components include:

- Spacial Blend - Helps to achieve a more realistic 3D sound.
- Reverb Zone - Helps emphasise the realism or expression of the environment of the game.
- Volume Roll-off - Used to make the sounds (from audio Source) attenuate according to the players distance from the audio sources position.
- Distance - Uses the audio source as a trigger for when the sound starts and stops attenuating. Also for determining the distance between the player and the audio source so that it can trigger certain events, such as when the player makes a sound that exceeds a specific level of frequency (volume) they will be attacked by the closest enemy etc.

7.4 Expected Sound Design

7.4.1 Player Sounds

- Footsteps (Gorilla steps) - For the aesthetics and awareness of the players movement.
- Breathing Sound(Idle + Running + walk) – For the game feel and realism of the game. This can also be perceived as a measurement of stamina. For examples, faster breathing sound would signify fear and decrease of stamina and increase of speed.
- Footsteps(based on ground type) – For the realness aesthetics and game feel.
- Hurt Sound - An aural cue for the player when they dealt damage.

7.4.2 Enemy Sounds(NPC)

- Foot-steps(walk + running) – natural human sound footsteps walking on grass, sand depending on the type of textures we will be using. These sounds will be aural cues which will alert the player about where the enemy is and/or when they have been spotted.
- Gun(cocking + shoot) - An aural cue for the player when they are being attacked. This sound will create suspense and awareness for the player that the enemy is about to shoot.
- Voices/chat – An aural cue to signal the player about the enemies' location and alert the player where they should or should not go.

7.4.3 Environmental Sounds

- Ambient nature sound(wind, trees, bird etc.) – sounds of moving cars will offer awareness of the surrounding.
- Opening steel gate - For the game feel and realism to emphasise that the player is escaping from its cage to run away from its masters.
- Radio/media announcement about a missing animal - Awareness of the purpose of playing.
- Background music – suspense music will be played during when the player is running away from the enemy to create a feeling of tension and suspense.

7.5 Help System

The game's help system will include a pause menu which will display the game's controls and level objectives, in case the player forgets. The game will not utilise a map, as it will undermine the use of sound for navigation.

8 Artificial Intelligence(AI)

8.1 Enemy AI

The enemies will move in a specific pattern at all times. This pattern will only be broken should they detect the player either through audio or visual. Should the player be detected, the enemy will follow and shoot at the player until they lose sight or auditory clues. If they lose track of the player they will move back to the designated position within in the enemy movement pattern. Some enemies are also programmed to search hiding spots for the player and initiate the same chase actions as the others if the player is found in that hiding spot.

8.2 Support AI

There are visual and auditory systems in play for when the player is detected by the enemy. Also there are collision markers for when the player is hit by an enemy dart to show the player that they've been hit and where they got hit.

9 Technical

9.1 Target Hardware

This game is created to run on *Windows* computers. The game is created to require decent processing power but it is optimised to run on most computers, with lesser graphics quality for lower level computers.

9.2 Development hardware and software

The game was developed on *Dell Inspiron 157000 Gaming laptops* using the *Unity* game engine. Art assets were developed using Krita and 3D models were created using *Blender*. Recorded sound effects were recorded using *Audacity*, and *FL Studio* for sound editing.

10 Game Art

A focus on creating visuals that capture nature's beauty in an audio based game seems a bit arbitrary. the use of visuals is the inverse of why visual based games use sound. We find an artistic visual focus necessary to contextualise the sounds within the game. Visual contextualisation is meant to aid audio communication. The player hears a variety of forest sounds, but needs to know where they're coming from to better comprehend what they are communicating. The use of visuals is also meant to enhance immersion, because it allows the player to interact with the game using more senses.

10.1 Key Assets

All assets will be 3D modelled in Blender and coloured in either Blender or Unity. A gorilla will be modelled, however, due to the game's first person view, only its arms will be detailed. These are the only parts of the gorilla seen by the player. The rest of the body will be a very simple structure which its shadow can resemble a gorilla. The circus' assets include cages, trailers, and a tent with stands inside. The jungle's assesses include trees, tall grass, bushes and rocks and flowers. A pick up car, which will save Abreham will also be modelled.

10.2 Shapes

We will use a low poly art style because it is simple and therefore time efficient. Simplicity and the cartoony look also emphasise the aesthetic of gentleness, as these concepts are often associated with children's art. However, as seen in Aragami and The Witness, there is a sense of realism, because the objects are not made of hard edged geometric shapes. We will therefore use more organic shapes with edges that are not as rounded as in real life. The purpose of stylization will be to emphasise the defining shapes of nature to highlight its beauty. The low poly art style also has a cheaper polygon budget, which will result in a better optimised game.

10.3 Colour

Due to the bulk of the game being set in the jungle, a majority of the game will have a cold, natural colour pallet. Shades of green will be used for trees and grass, shades of brown and grey will be used for rocks and dirt. Shades of blue and hints of orange will be used for the early morning sky. These colours will have a medium saturation to communicate the time of day and emphasise the gloomy

aesthetic. Hints of warm, saturated colours, such as orange for the rising sun and pink, red and yellow will be used to communicate the theme of gentleness and beauty within a dark, dangerous world.

10.4 Lighting and Shadows

All objects will have matte materials, to reinforce the low poly stylised feel. Most low poly games don't have light reflecting off objects, rather the objects' colours are in different tones to communicate depth. The game will have dark, hard shadows, to reinforce the stealthy, gloomy and mysterious aesthetic. Ambient orange lighting will indicate the sun rising, which will be a time indicator.

10.5 Effects

To ensure that the player doesn't rely heavily on visual communication, we will be using fog, as seen in Aragami. The use of tall grass will also assist in doing so.