

Exergame

Group: #3

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1. Introduction

Name: FitFighter

Purpose: Our goal is to help gamers become more active and improve their strength and stamina in a fun and engaging way.

Exercise: High intensity interval training in versus mode, strength and stamina training in exercise mode

Platform: Console & PC

Short description: Our game is a fighting exergame where you build up your strength, stamina, and in-game stats by performing exercises, and then fight in high-intensity PvP fighting game-style versus fights that mimic high-intensity interval training.

Technology: Screen, motion trackers, hand controllers, heart rate monitor

2. Theory

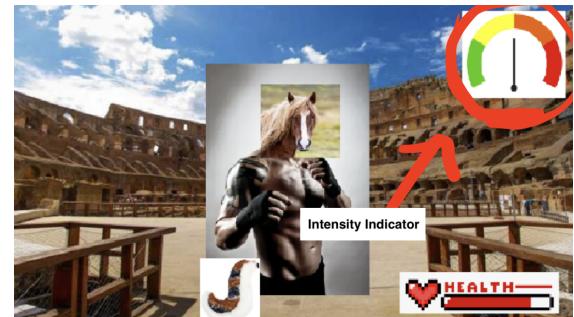
Having recognised the importance of a strong theoretical foundation to our game design was important, we decided to use the suggested Dual Flow model as the core of our design, as outlined in the paper “Exergame development using the dual flow model” by Jeff Sinclair et al. (2009). The paper notes that there are two exergame success factors that are “... critical to the success of exergames ...”, namely Attractiveness and Effectiveness. In the paper the authors model the attractiveness based on Csikszentmihalya’s flow model, which can be described as a balance of “.. the player’s perceived skill with perceived challenge.”. Effectiveness is modeled as “... the physical balance between fitness (...), and intensity (...).”. Thus our goal is to ensure we balance these two dimensions to achieve dual flow.

Effectiveness of the exercise is important to ensure the player is getting an appropriate leveled workout for their exercise. Being pushed through a workout that

is too hard can make the player prone to risk of injury, while a workout that is not intense enough would not give the same health benefits. Our exergame addresses this by making a performance evaluation part of the introductory game tutorial. In this stage the players current physical health, stamina etc. will be estimated and then used to customize the game rounds/work outs to the players current level. FitFighter has several levels of both difficulty based on both the players stats and exercise intensity based on the players fitness level.

Another challenge with exergames is to ensure that they are challenging enough to provide an actual health benefit. We decided to use the guidelines for effective aerobic sessions as exactly that, a guideline, when modeling our game. (*Exergame development using the dual flow model*, Jeff Sinclair et al., 2009) These guidelines suggest a three part workout consisting of warm-up, stimulus and a cool down. We implemented all of these three as part of our game by having each match consist of a warm-up where the player is shown slow and easy exercises to get their body moving and getting warm before the actual workout. The matches against your opponent is the main stimulus and lastly we did a cool down where the player gets feedback on their performance. In addition to splitting the exercise into three parts the game helps the player stay in their optimal heart rate zone throughout the game, we are providing feedback continuously to the player through a monitor displaying both the heart rate and if it's in the ideal zone for this portion of the workout.

Our intensity indicator tells the player how they are performing. If the arrow points to the left, the green field, this indicates that the players intensity is too low and in order to perform better and increase their chances of winning their battle they need to up their intensity. Likewise, if the arrow points to the right, a red field, the player is pushing themselves too hard and should ease down to avoid burnout.



We believe these efforts ensure the effectiveness of the game, but we also need to work on the attractiveness of the game as outlined in the Dual Flow model. Exergames only work as an incentive to work out and get your body moving if the player actually enjoys the game. By balancing the player's skills with the difficulty, in singleplayer using variable difficulty, and in multiplayer by using an effective matchmaking system that matches players based on skills, we believe we have a strong element of flow that works as the basis of our game's attractiveness. In the story-mode there are also elements for extrinsic fantasy. The player's skills will affect how the story progresses.

In the research done on the exergame named Exermon one of the participants that tried the game stated: "Being able to compare my exermon with my friend's exermon motivated me to improve" 63% of other participants agreed with this statement,

indicating that the social aspect is very effective in motivating players to keep playing and working out. (*Evaluation of the Game Exermon*, Alf Inge Wang et al., 2017) This inspired us to include features such as friend lists, a leaderboard and a multiplayer function where you can challenge and play against your friends. Here you would be able to see the score of your friends and compare them to your own. The social value of these elements is important and having scores on the leaderboard makes it super easy for competitive players to compare their scores to their friends.

Based on Hao Wang and Sun Chuen-Tsai's paper from 2011 "*Game reward systems: Gaming experiences and social meanings*" we have included glory rewards as additional motivation for our players. As previously mentioned we have a *score system* allowing people to compete against both other players and themselves. Our story mode also features *plot animations and pictures* to motivate the players to keep playing. Throughout both the story mode and the online battling players will be presented with *feedback messages*. Lastly we have an item granting system where the players can get both in-game currency and skin-customizations as rewards for good performance.

We assume most of our players start the journey and pick up this game because they are interested in an entertaining way to move their body. They are then onboarded by the introductory tutorial mode with evaluation of their skill. To ensure people stay for the scaffolding stage, working repeatedly to reach their goal, we made sure the game has a story mode. For the endgame we hope to retain our veteran players by competitiveness. We recognize that playing with friends helps make each new match feel more fresh and different, helping to keep the gameplay fresh.

3. Game Design Document

What type of health effect are you aiming for

Our goal is to induce a positive effect on cardiovascular capacity through high-intensity interval training (combat mode), and muscular strength (through the training mode). Additionally, while not directly related to health effects, we hope to teach some basic self-defense techniques as well.

Story

As part of our game, and to offer players a fun alternative to playing online, for example to learn the game mechanics outside of the training mode, there is a relatively simple campaign mode. The campaign will not be very long or complicated, being mainly focused around a loosely tied together story that takes the player around different stages where they fight NPC characters and learn the mechanics of

the game. The campaign will consist of several shorter cutscenes where the player character interacts with the game character and which lead into duels with the antagonists of the story.

The campaign will support adjustable difficulty to allow both experienced players and beginners to enjoy it, as well as a few missions at the start that have optional interactive tutorial elements to demonstrate the game mechanics and concepts to the player to help learn it if it's their first time playing the game.

Characters

The game will contain several NPC characters that are featured in the campaign mode outlined in the story section. These NPC characters will be designed with defined personalities and visuals that make them appealing to the players and hopefully makes playing the campaign more enjoyable.

Personal Trainer & Avatars

In the training and exercise portion of the game the player is guided by a personal trainer NPC akin to what is present in Wii Fit or Ring Fit Adventure, which shows the player how to perform different exercises correctly and provide motivation and feedback.

Each player also has their own avatar that represents them in the game, and which can be customized. Avatars can either be customized with “full” skins (outfits designed by the designers) or different parts of the character (arms, clothes, hair, etc) can be customized individually. We chose to support both detailed and simple customisations because different players have different preferences.



(From Tekken)

Level/environment design

Our game will feature a collection of different types of levels intended to be decently realistic. Generally speaking we will have three types of levels, categorized as “landmarks”, “arenas”, and “special”.

Landmark levels are inspired by real and recognisable landmarks from around the world that are visually appealing and also intended to minimize distractions for players that prefer to focus on the actions of the characters rather than a busy background.

Examples of landmarks we could recreate in the game:



Arena levels are designed to look like fighting arenas one could expect to find in modern fighting sports like boxing, mma, or similar. They will feature crowds that react to the action in the fight with cheering, to make players feel rewarded when they do well in the game.

Examples of arenas we would use as inspiration for the arena levels:



Special levels are levels designed to be used in the story or as interesting levels that do not fit in the other two categories. These are intentionally less conventional and thematically consistent to make the levels fun and interesting for players to play in, and where you wouldn't normally expect to see characters fight, such as an airfield or an active volcano.

Examples of visuals we would like to recreate in the game as special levels:



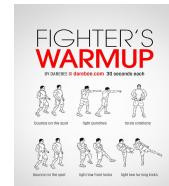
Gameplay

We have three game modes: warmup, combat, and cooldown.

Warmup

Perform light exercises like pushups and squats in order to get the blood pumping. Your personal trainer will also repeat what they said last debrief (what you should improve on for the upcoming battle).

Technique training versus the trainer if necessary.



Combat

High-intensity interval training. Players go head-to-head and try to reduce their opponent's health to zero using variations of punches, evasions, and blocks to counter each other. One round is four minutes, after which there is a three minute pause for matchmaking to find a match and for the player to rest. The player can repeat the intervals as long as they please, but only the first 20 minutes rewards XP bonus.



(From WII sports)

Cooldown

Perform light stretches with your personal trainer while they debrief you on what you've improved on since last battle technique wise and strength wise, and what you could improve on for the next battle. XP is rewarded at the end to prevent players from stopping right after combat (the fun part)



Social Features

In the game players can manage friends like in other competitive games (add, remove, block, the ability to send friend requests to people you duel), but we also want to put increased emphasis on mutual cooperation or competition between players to stay motivated. By showcasing your friends avatars and seeing them succeed in the game we hope to keep the player motivated while using the game.



Art

Our art style will be inspired by popular contemporary games such as Street Fighter V or Tekken 7, with a semi-realistic artstyle with cartoonish characters and customisation options to motivate the players to engage with it. Below we've attached some character and environmental art that we would be using as references and inspiration for the look of the game. These games employ fun

character design with appealing visuals to draw in players, and we think taking inspiration from the most successful franchises would be a good place to start.



(From Street Fighter V).



(From Tekken 7)

Sound and Music

Similar to our inspiration for the art style we have decided to draw inspiration for sound and music design from successful contemporary games. We'll avoid going into further detail considering sound design is not our field of expertise.

User Interface, Game Controls

The game is played using a TV/PC screen, motion trackers and hand controllers. In combat mode, players come face-to-face (first-person) with their opponent, with a HUD that shows health and intensity.



Accessibility

Our game will support several standard accessibility features such as color-blind mode, UI and font adjusting etc, but because the game requires performing exercises and full-body movement we will unfortunately not be able to support access for everyone.

One feature we want to support though, is "upper body" mode, which allows the user to replace exercises that require lower-body movement, and in PvP versus mode the players have access to different moves to execute combos that only require upper-body movement.

Monetization

Players can buy skins and customisation items for their avatar, which they can see in combat mode and during cut-scenes in the campaign. Players will also be able to buy skins and potentially other customisation effects like different voices for their personal trainer AI. We also plan to partner up with game/anime/other franchises for crossover skins and voices, similar to what Fortnite has done.



(From Fortnite)

4. Concept

URL: <https://www.youtube.com/watch?v=rmNXm5p2Uu8>

5. Reflection

This time around we struggled a bit with staying on track and within the scope of the assignment. In the brainstorming process we were at one point discussing a pair of AR-running glasses with all kinds of cool games, but we decided that was more of an “exer-technology” and not an exergame. Eventually we ended up with FitFighter. This might have been an easier and more streamlined process if we had used the same process as last time where we each prepared a concept beforehand and presented this to the group. Not preparing and just brainstorming as a group from scratch took up a bit more time.

Reflecting on our experience and feedback on our last assignment we have spent more time on the visual this time. Both the video presentation and having more visuals throughout the game design document. Otherwise our development process and how we used the theory from the lectures to flesh out our concept was quite similar to last time as that worked well. Like last time we have worked well together as a group, organizing weekly meetings at campus to work consistently. We also chose this as we feel we as a group benefit from seeing each other and working together rather than simply splitting tasks between us and working alone.