Advanced Technologies : How can games technologies facilitate immersive relaxation experiences?

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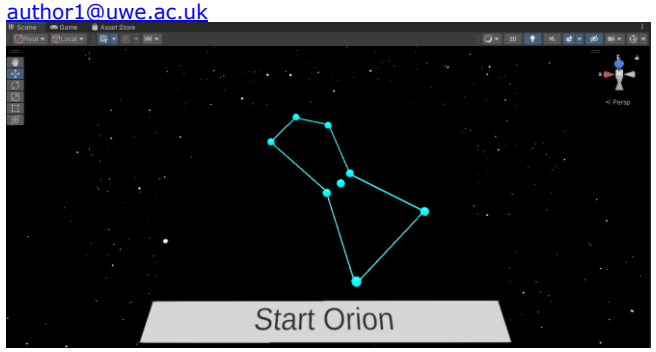

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Introduction

Relaxation is important for many people to relieve stress and pent-up emotions and put people at ease. Stress has a major impact on people's lives with damaging impacts on physical and mental health (Thoits P, 2010). Therefore, relieving that stress is important for people who want to improve their overall health. This project dives into how games can facilitate a relaxing environment and experience to help relieve that negative stress and put players into a better state physically and mentally.

Through research done, virtual reality was chosen, and an immersive puzzle game experience was made to help stimulate the players brain and distract them from their stress. It includes different types of puzzles as well as a soothing environment and sounds to properly put the player at ease.

While some of the experiences may not be seen as relaxing, the project does succeed in creating a stress-free environment that distracts the player from their stress with puzzles.

Background Research

Relaxation is an emotional state of low tension in which there is an absence of negative sources such as anger, anxiety, and fear. One method some people use to feel more relaxed is through video games. Not only do video games provide a good distraction from the stresses of life but they also lead to higher levels of dopamine which make you feel good. In a study by Ahmed, M., Sayed, E., and El-Ghadban, F. (2021), children undergoing chemotherapy has higher mean scores regarding happiness and relaxation. This helps explain the link between high happiness and high relaxation.

In video games, creating an immersive experience can be tricky. However, virtual reality provides both an immersive experience with a relaxing experience. Studies to do with relaxing environments and experiences in VR specified relaxation as a primary outcome (Riches, S. et al. 2021).

While linking virtual reality to relaxation, it does specify the idea of creating a positive environment that is experienced in VR. Environment in which there is very little happening lots of silence broken up by natural sounds have the highest and restorative effect on psychological states and bring on the most relaxation (Gerber, S.M. et al., 2019). An example of this might be natural environments such as the wilderness or nature.

Sounds and music also have a part to play in relaxation as stated above regarding creating a relaxing environment. Research has found that relaxing music with a slower tempo and less heavy beats provide the most relaxation (Jaber, S. et al. 2007).

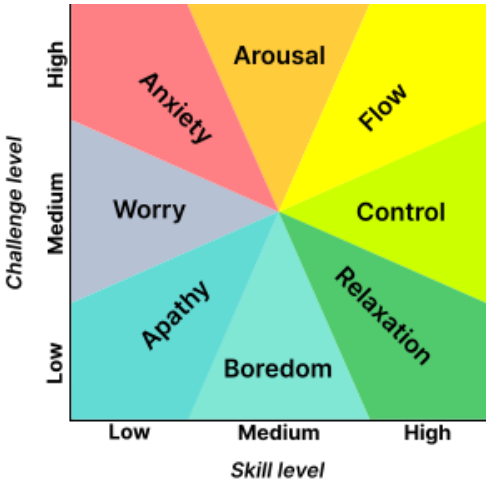

Fig 1: Mental states of challenge and skill level by Csikszentmihalyi, M (1997)

While a relaxing environment may be enough for people to fall into a relaxed state, as this project looks into how video games can facilitate a relaxed environment, there might as well be some level of interaction or goal to further keep people relaxed through distraction. One way of doing this is through solving puzzles. While also keeping the mind relaxed through distraction and keeping thought away from those that may cause stress, puzzles also provide a great way to wind down into a meditative state by subtly stimulating the brain while keeping the mind at ease. The model of Csikszentmihalyi, M. (1997) that helps explain flow can be used to help explain this idea as the model puts a state of relaxation on the scale of high skill level with low to medium challenge.

Another form of relaxation may be through destruction. The theory of catharsis is a powerful emotional release that when successful can cause immense positive changes in mood as the build up of stress is lifted. This has been translated into Rage Rooms in which people take out their anger or stress on physical object in a safe environment to relieve stress.

Outcomes

Based on research collected, a VR puzzle experience was made in an effort to relax players. The puzzle experience takes place in space and players need to solve a variety of puzzles in a single level in order to eventually build a constellation and complete the level. Upon completion the player would move back to a central hub world where they could decorate their space with different constellations they have completed.

While some may find the expansiveness emptiness of space overwhelming or scary, there are plenty of examples of space being a happy and therefore relaxing environment for people. Astronauts in particular look fondly at being up in space and being able to marvel at the objects and constellations around them.

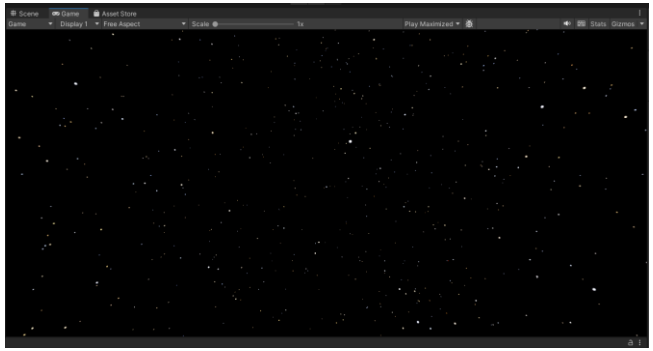

Fig 2: Relaxation project final look at the space environment chosen.

While space is known for being a silent vacuum, this didn't feel right when creating a relaxation experience. Therefore, music and sounds were included in the project to help the player relax. While no music was considered at first, it led to a stressful environment and made the space feel more eerie than relaxing. Sounds were also included when completing puzzles and during events to make the space feel more relaxing as well.

While developing the level, the colours used for the puzzles needed to also feel relaxing. Colours such as blue were used as they were seen to be cool and relaxing while red was avoided as it felt like a harsh

angry colour. However, during development, it becomes hard to let players know of their mistakes. Red is normally perceived as a colour to communicate the fact that a player has made a wrong decision. This became important when designing the puzzles as without red the player may not see where they are going wrong. Therefore, although red is used, it occupies a very small section of the game and is only used to communicate the state of the puzzles in the game.

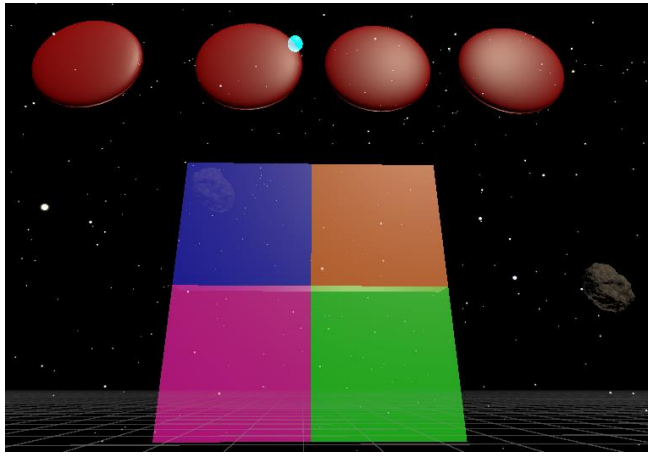

Fig 3: The project "Simon Says" puzzle where cool and relaxing colours are being used with the red in there to show mistakes the player makes.

With the environment created, attention turned to the puzzles created to distract and relax the player. The puzzles selected used systems that the Unity virtual reality toolkit could accommodate. The first of which being like a jig-saw puzzle in which players would slot objects into sockets. The puzzle sticks to the space theme and involved the player putting planets into the correct position. The correct position related to the planets position in the solar system in relation to the sun with Mercury being the planet on the far left signifying its close position to the Sun and Neptune being on the far right. Players would need to explore the environment and complete the tasks around them to find the missing planets from the solar system model and place them in the correct position. Completing the puzzle would result in the next step of the level being accessible for the player.

Another part of the level is the destruction aspect in which players used a laser pistol to destroy asteroids to find certain items they need. These included planets for the previously mentioned puzzle and pieces for the "Simon Says" minigame. The laser gun uses the input system created with the Unity XR Interaction Toolkit to shoot and fire a laser that destroys asteroids. The laser gun uses a ray cast to detect objects that can be shot and slowly brings down the objects health until it reaches zero in which the asteroid would make a satisfying explosion sound and visual effect.

Fig 4: Progress video 6 screenshot of the laser gun being used to destroy an asteroid.

As mentioned in the research section of this report, the idea of destruction as a way to relieve stress is a valid one and this mini game/puzzle facilitates the fantasy of destroying objects in space in order to continue on with the level. It also provides boosts of mood with a sense of completion when objects are found in the asteroids.

The last puzzle in the level is the "Simon Says" puzzle. This last objective is only accessible when the player finds all four panels to play the puzzle. The panels are rewards for completing the previously mentioned puzzles as well as exploration around the area presented to the player. "Simon Says" is a multi-stage puzzle in which the player needs to remember a sequence of colours and repeat that sequence to progress. The puzzle has several stages to it with increased difficulty as the sequence of panels increases with every completion. However, with every completion the player gets closer to completing the constellation appearing behind the puzzle. This provides a sense of excitement for the player as they see their hard work of completing the puzzles paying off until the puzzle is complete.

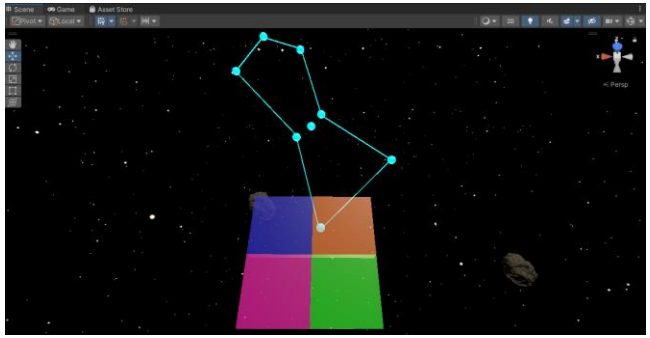

Fig 5: "Simon Says" puzzle with constellation.

After the puzzle is complete the player is returned to the menu where their completed constellation sits with the option to play it again, play another puzzle or reposition the constellation they made around the area to decorate their space.

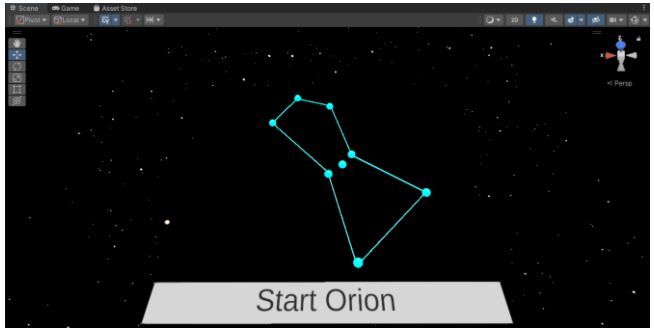

Fig 6: Orion constellation puzzle completed on the main menu.

Evaluation

Evaluate your outcomes and your approach, suggest further improvements or directions.

Simon says not very relaxing – kinda stressful
Problems with destructive therapy.

The puzzle game experience has a lot of aspects that help facilitate relaxation. The environment for example, while it may not be for everyone, does help produce a relaxed state, mainly thanks to the music choice used. The vastness of space does, however, feel too empty. What may help in future levels is populating space a bit more with some planets or constellations in the environment that players can just stare at and enjoy.

There are some issues with some of the puzzles as well. The "Simon Says" puzzle, while being a distracting experience to help with relaxation, does at some points feel overwhelming. While playing, players may feel stressed trying to remember the combination of colours that need to be pressed to succeed which overall takes away from the aims of the level. In the future, it may be worth considering different types of puzzles that can be used that don't heavily rely on players memory or time limits.

Finally, destructive therapy does in some cases help with stress, however there is a lot of risk involved in this. With this project, the risk is low for destructive therapy as it involves virtual destruction rather than physical. However, if this was to be escalated and more destructive elements be introduced into the project, it may lead to some issues with some people who have ongoing problems with violent outbursts and impulse control. Therefore, it is important to keep this in mind when developing new levels.

Overall, while only being a prototype, the project does help induce relaxation in its players. In the future, it may be worth looking at different types of puzzles to include that aren't too difficult to help keep players distracted but also are stimulating.

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