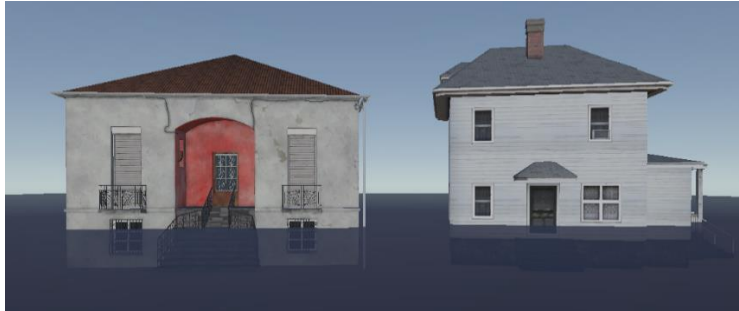


Introduction

Often people will hear statistics about climate change that they may not understand the severity of these statistics. This application aims to increase awareness and education about climate change by introducing a visual medium where people can view the actual effects of climate change through virtual reality.



Application Overview

This virtual reality (VR) application simulates the effects of rising CO2 levels on a location over time, offering users an immersive experience to observe environmental changes. The primary goal of the application is to transport users into a 3D environment where they can observe these changes in a realistic setting, witnessing the decline of animal species, food variety, and rising sea levels as carbon dioxide levels escalate. The immersive nature of virtual reality allows users to experience these changes firsthand, either by flying through the town to gain a bird's-eye view or teleporting to specific locations to observe the impacts up close. This navigation system provides a comprehensive understanding of the scenario by allowing both on the ground and birds eye view explorations of the environment. The application also gives the user the ability to experience the drastic changes over a timeline, seeing the progressive changes more evidently than what is seen in real time displaying how much of a pressing issue climate change is for future generations.

Significance of application

In the context of raising awareness about the environmental consequences of rising CO2 levels in the earth's atmosphere, this VR application acts as a powerful educational tool which enables users to visualise the devastating effects first hand. Unlike using more traditional teaching methods, the application allows users to emotionally engage and connect with the 3D environment in a way that they can't with 2D graphs or research papers, which allows for a better understanding of the long term consequences that increased carbon emissions provides to society and the ecosystem. The ability for users to engage with realistic simulations of this potential future reality makes the

significance of climate change more tangible and personal. This approach makes the application essential for educators and policymakers because it more effectively demonstrates the urgency needed for change and action on this issue.

Significance of interface technology

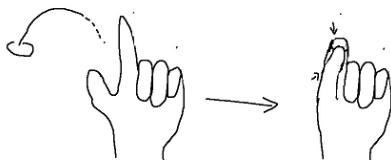
Virtual reality technology is fundamental to the success of this application, as it immerses the users into a realistic environment making the experience more real and impactful which is vital for raising awareness and driving change to address climate issues. The virtual reality interface is designed for ease of use and with intuitive controls that enhance user experience. Our applications interface is designed to be minimalist ensuring the screen is free of clutter to maintain immersion and to ensure easy navigation without any steep learning curves. This makes interacting with the application accessible for a large variety of audiences including those who are unfamiliar with virtual reality interfaces and technology which is crucial for creating the most inclusive and widespread engagement. The realistic environment is what sets our application apart from traditional methods of education on the topic as it encourages engagement and immersion which creates more heightened awareness and motivation for action.

Interaction Design

Teleportation

This is needed in order to move around on the ground

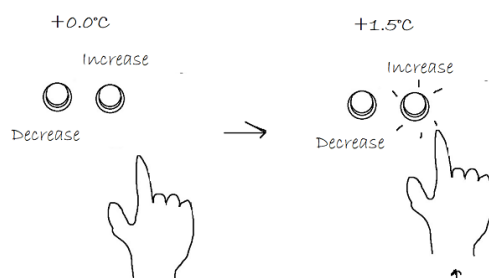
Teleportation



Adjusting Global Temperature

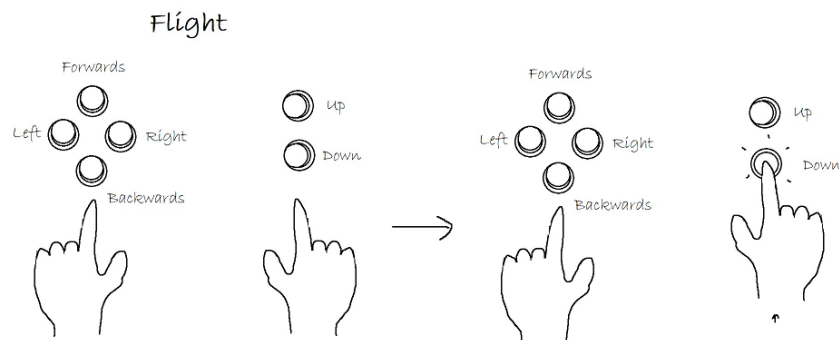
This is needed to show the effects that different temperatures would have on the environment. This changes the severity of the viewing interactions such as sea level rise, species decline, and food variety decline.

Adjusting Global Temperature



Flight

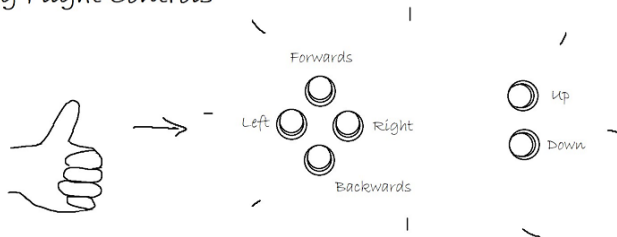
This is needed to show an aerial view of rising sea levels.



Toggling Flight Controls

This is need to clear the screen of buttons so that the user can view the scene without obstruction or to enable the user to fly.

Enabling Flight Controls

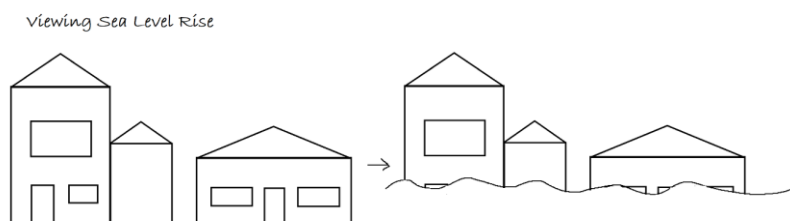


Disabling Flight Controls



Viewing Sea Level Rise

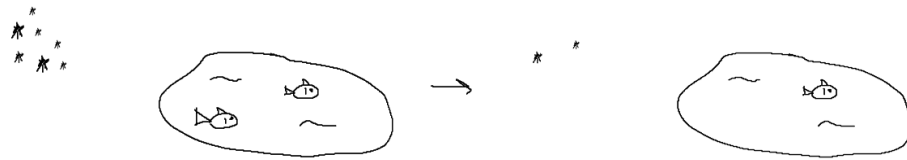
This is needed to showcase to user's the effect of rising sea levels on coastal areas.



Viewing Species Decline

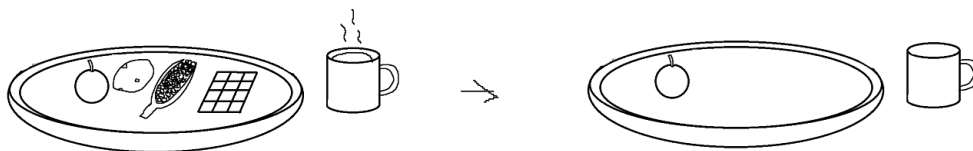
This is needed to showcase to user's the decrease in creatures due to climate change.

Viewing Species Decline

Viewing Decrease in Food Variety

This is needed to showcase the various types of food that may disappear due to climate change.

Viewing Decrease in Food Variety

**Technical Development Planning**

The software library we intent to use is the Meta Interaction SDK. The chosen interface technology is virtual reality and relevant hardware includes an Oculus Quest 2 or Oculus Quest 3. Specific functions we may need include a flight function that moves the user, a function that increases the sea level, a function that disables objects such as food or creatures, and a function that sets the global temperature.

Initial 3D Models

The 3d models we will need will include models for various types of foods and drinks, species, landscapes, and buildings.

Mosquito

This model is a creature model that will increase in number with an increase in temperature.



Bee, Fish

These models are creature models that will disappear with an increase in temperature.



Farm House, Old House

These models are environmental models that will be used for reference with an increase in sea level.



Chocolate Bar, Corn, Potato, Tomato, Coffee

These models are food models that will disappear with an increase in temperature.



Conclusion

The application will provide a number of ways to visualise the effects of climate change in order to improve users' awareness and understanding of global temperature increase. This will be done by showing increasing sea levels, decreasing species and decreasing food variety. These will depend on the global temperature increase set by the user. Accompanying this will be some additional statistics such as the year we are expected to reach the temperature as well as the amount of carbon in the atmosphere.

References

3D Models

- Bee: LasquetiSpice (2022). *Animated Bee Flying Landing Loop* [online] Sketchfab. Available at: <https://sketchfab.com/3d-models/animated-bee-flying-landing-loop-a39c45911dab421da0de51672c7a8f62> [Accessed 22 Oct. 2024]
- Chocolate: Blender3D (2018). *Simple Chocolate Bar* [online] Sketchfab. Available at: <https://sketchfab.com/3d-models/simple-chocolate-bar-6e9c67e3adc345a4b12d0e4f825851a2> [Accessed 22 Oct. 2024]
- Coffee: AK STUDIO (2021). *Coffee Cup* [online] Sketchfab. Available at: <https://sketchfab.com/3d-models/coffee-cup-992750b0df674378989fa915b0688ce1> [Accessed 22 Oct. 2024]
- Corn: tsutomu.saito (2022). *Corn* [online] Sketchfab. Available at: <https://sketchfab.com/3d-models/corn-2cb1ab1a393448e1ace72808c5b1d505> [Accessed 22 Oct. 2024]
- Farm House: MaX3Dd (2022). *Farm House* [online] Sketchfab. Available at: <https://sketchfab.com/3d-models/farm-house-ee792a21ec6744d9a5488118b1a88750> [Accessed 22 Oct. 2024]
- Fish: Yimit (2019). *Fish* [online] Sketchfab. Available at: <https://sketchfab.com/3d-models/fish-c4328d6c1ae445198abc1a3d4c1e2570> [Accessed 22 Oct. 2024]
- Mosquito: rayray (2023). *Mosquito VFX* [online] Sketchfab. Available at: <https://sketchfab.com/3d-models/mosquito-vfx-d3d2216cddf54236bc4e138c3561c3b5> [Accessed 22 Oct. 2024]
- Old House: sakislaspas (2024). *Old House* [online] Sketchfab. Available at: <https://sketchfab.com/3d-models/old-house-77324271ad6248468b17d3c41bb28b26> [Accessed 22 Oct. 2024]
- Potato: Moshe Caine (2021). *Potato* [online] Sketchfab. Available at: <https://sketchfab.com/3d-models/potato-0f4be86441694633b42c764a4574fd41> [Accessed 22 Oct. 2024]
- Tomato: Moshe Caine (2021). *Tomato 2* [online] Sketchfab. Available at: <https://sketchfab.com/3d-models/tomato-2-201d42a9e5e54f1b836eff39a892ed88> [Accessed 22 Oct. 2024]