SUMMARY

"Know IITR" is an augmented reality-based app specifically created for visitors to IIT Roorkee. Its purpose is to address the challenges faced by visitors when navigating the campus and understanding the historical and significant aspects of the various buildings. By providing an easy-to-use and engaging solution, the app aims to enhance visitors' experiences and deepen their appreciation for IIT Roorkee.

Using augmented reality and 3D models, "Know IITR" offers an immersive and informative experience for users. The app features three prominent buildings on the campus: James Thompson, Convocation Hall, and the Electrical Department. By scanning the marker associated with a specific building, the app showcases a 3D model of that structure, allowing visitors to explore it virtually.

To further enrich the experience, the app incorporates an AI model that provides detailed information about the selected building. Users can access historical, architectural, and other relevant details through the app, enhancing their understanding of the campus and its structures.

This app "Know IITR" provides visitors to IIT Roorkee with a unique and interactive way to navigate the campus, explore significant buildings, and gain valuable insights into the rich history and architectural marvels that define the institution.

DEVLOPMENT

The App is Completely Made Using Unity, the 3d Model was made using Blender and the following SDKs were Used:-

1) Unity: Unity is a powerful game development platform that was utilized to create the entire app. Unity provides a wide range of features and capabilities, including 3D rendering, physics simulation, animation, and cross-platform deployment.

2) Blender: Blender is a popular 3D modeling and animation software used to create the 3D models of the buildings featured in the app. Blender offers a comprehensive set of tools for modeling, texturing, rigging, animation, and rendering, allowing for the creation of detailed and realistic virtual assets.

3) AR Core: AR Core is an augmented reality software development kit (SDK) developed by Google. It was used in “Know IITR” for image tracking and AR development. AR Core enables the app to recognize specific markers associated with each building, facilitating the placement of virtual 3D models on the real-world environment captured by the device’s camera.

4) Ready Player Me: The Ready Player Me SDK was integrated into the app to enable the importation of custom 3D models. Ready Player Me is a platform that allows users to create personalized avatars and other virtual assets. By using this SDK, “Know IITR” enables users to incorporate their own custom 3D models into the app, enhancing the personalization and customization options.

5) Google Text To Speech (TTS): The Google Text To Speech SDK provides the capability to convert on-screen text into audio in real-time. In “Know IITR,” this SDK is used to generate audio feedback and information based on the textual content displayed within the app. This feature allows users to receive spoken descriptions and details about the buildings and other elements of interest.

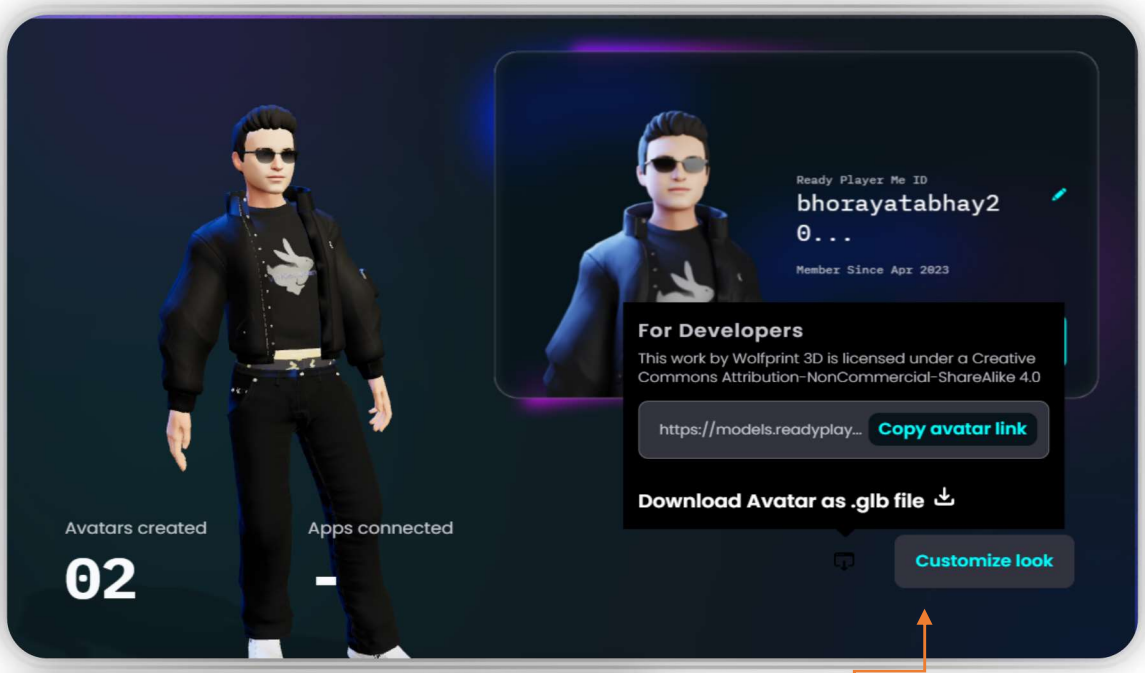
6) OVR Lipsync for Unity: The OVR Lipsync for Unity SDK is employed to synchronize the movements of the 3D character’s lips with the audio generated by the TTS system. This SDK utilizes machine learning techniques to accurately match the lip movements of the virtual character with the corresponding audio, resulting in a more realistic and immersive user experience.

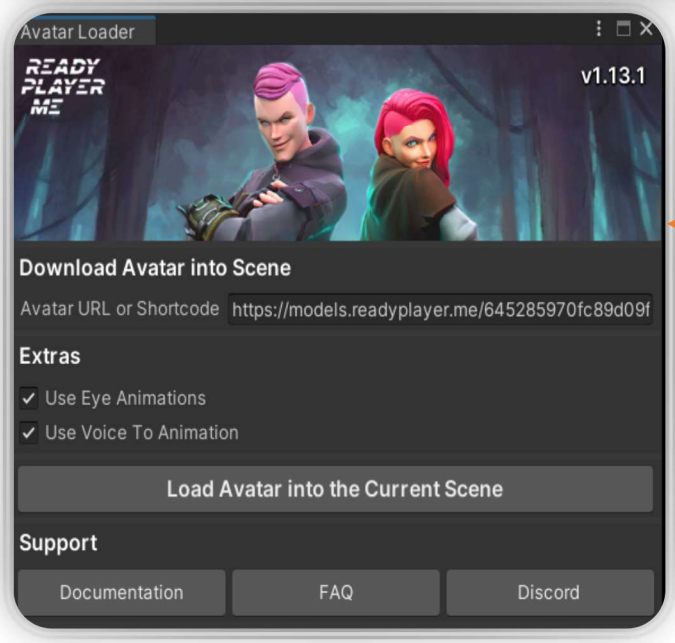
“Know IITR” app is developed using the Unity game development platform, with 3D models created using Blender. The app incorporates the AR Core SDK for image tracking and AR development, Ready Player Me SDK for importing custom 3D models, Google Text To Speech SDK for converting text to audio in real-time, and OVR Lipsync for Unity SDK for synchronizing lip movements with audio. These technologies and tools collectively contribute to creating an engaging and immersive augmented reality experience for users exploring IIT Roorkee.

External Software Used

1. READY PLAYER ME:

Ready Player me was used to upload the Avatar Model in unity in current scene.By Ready player me, we can create our own avatar or customize given model.RPM configuration enables to do model settings like model body movement features.





IT provides avatar link to be copied further.

And let avatar to be downloaded in current unity scene.

2. GOOGLE TEXT TO SPEECH

Firstly, we were using CHATGPT for audio content but it was generating unwanted content so instead of it, we have used Google text to speech for the same purpose. For this we need to provide content(text) input. To do this following step are followed:

```
private void Start()
{
    textok.text = inputField.text;
    TTSE.PressBtn();
}
```

Here Text from inputField is copied to textok and then PressBtn () method of TTSE is called.

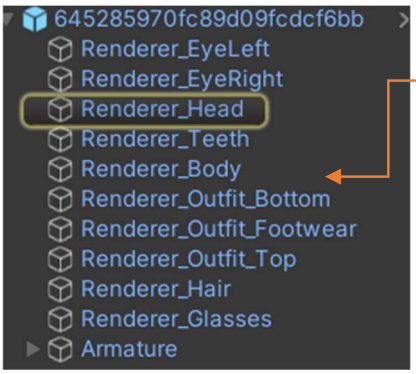
```
public void PressBtn()
{
    _errorReceived += ErrorReceived;
    _audioClipReceived += AudioClipReceived;
    textToSpeech.GetSpeechAudioFromGoogle(GPTref.textok.text, voice, _audioClipReceived, _errorReceived);

}
```

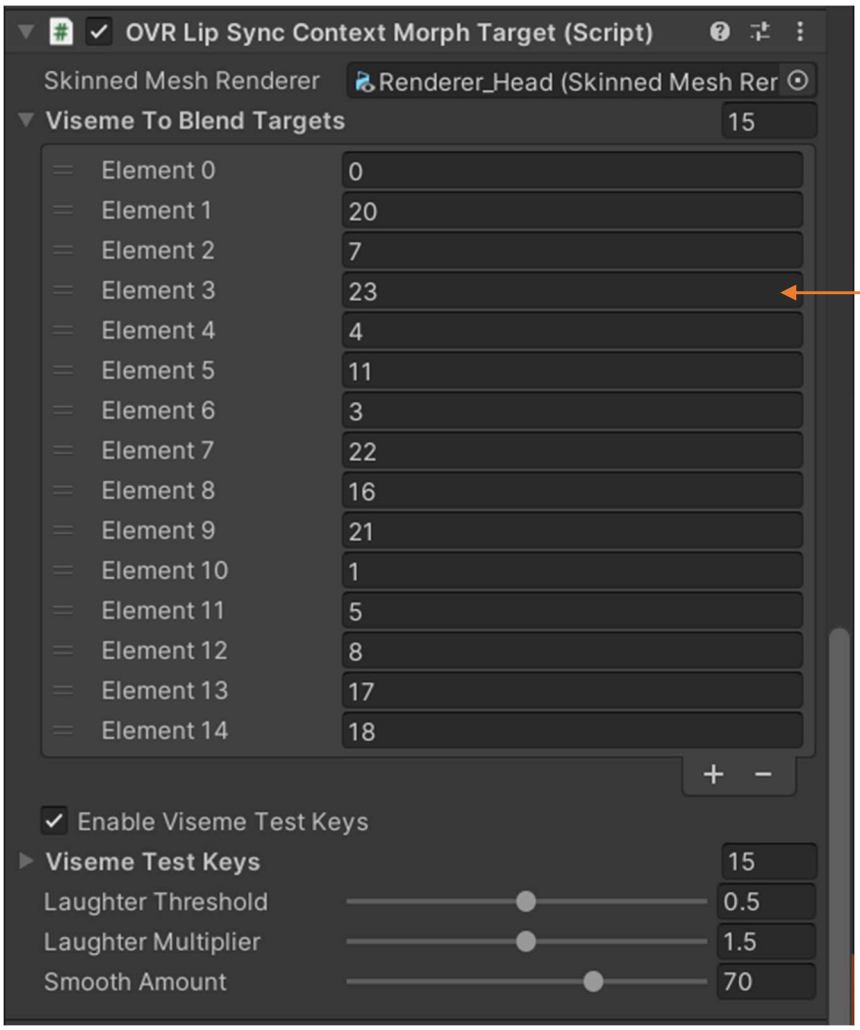
It sets up event subscriptions for error handling and audio clip reception and then triggers a method (**GetspeechAudioFromGoogle ()**) to generate speech audio based on the provided parameters.

3. OVR LIPSYNC FOR UNITY

This was used for For Syncing the Lips of the model with the Audio following steps:



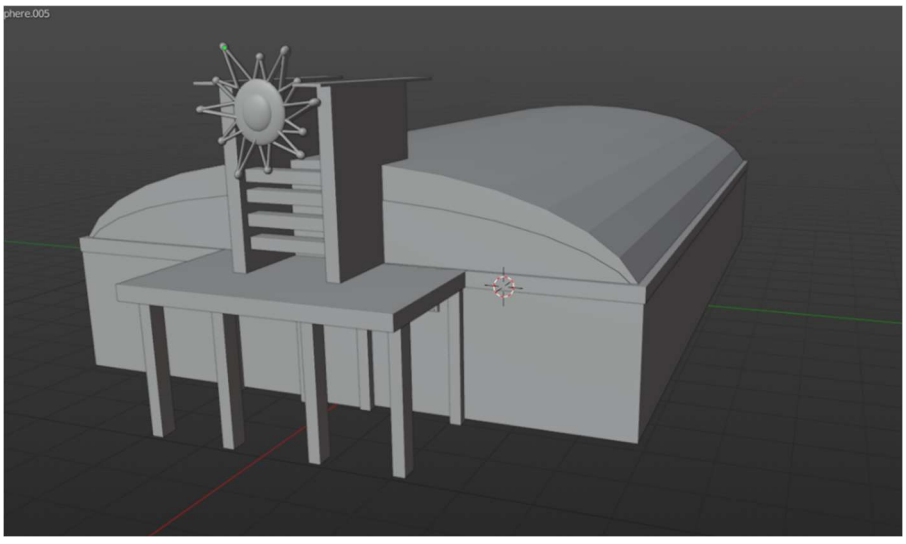
- We select head renderer mesh to modify its blend shapes

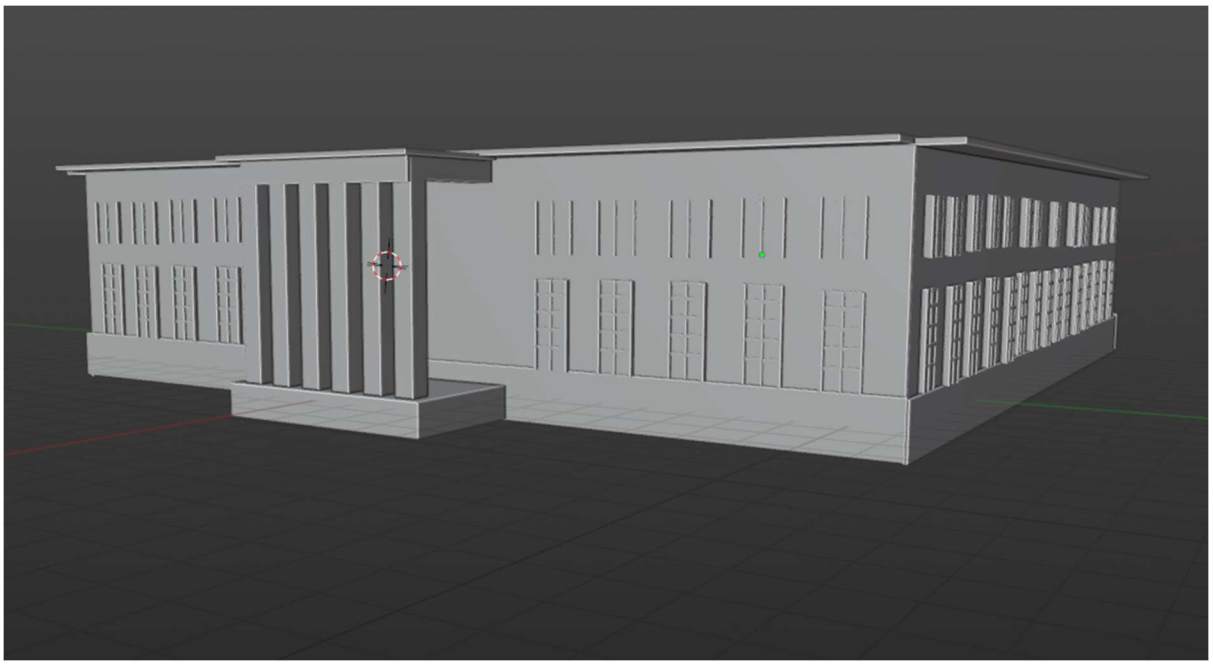


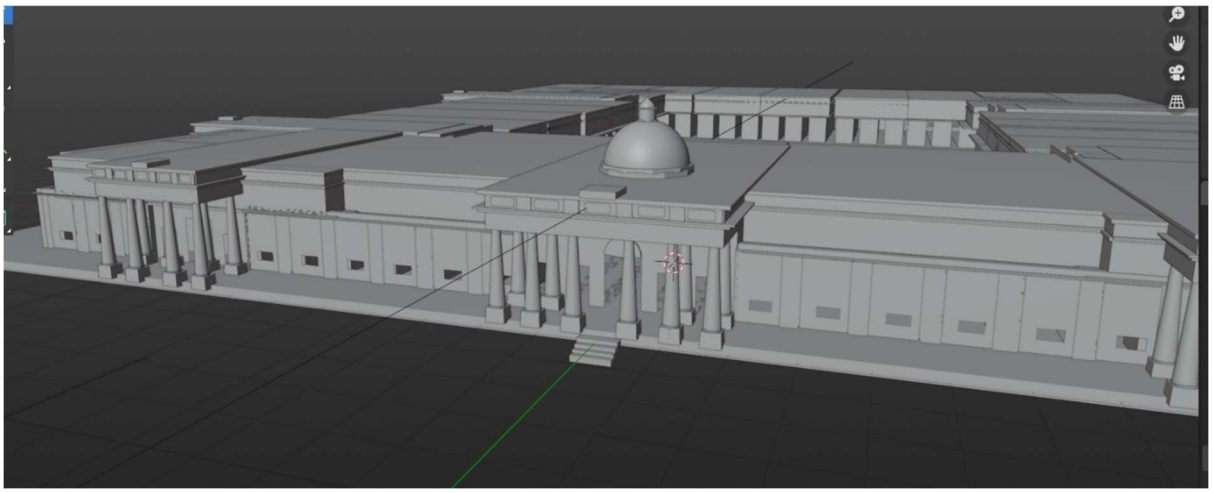
This defines the script by which we modify blend shapes. Here we control features like laughter value and smoothness amount.

4. Blender:

Blender was used to create 3D models of buildings. Following models were used:







Workflow of the app