**VTuber\_Unity Model**

**Goal**:

To visualize and reciprocate the motion of driving video into custom characters.

**Model brief:**

* Model approach is to work with animation characters (3D Model approach) which consist of head\_pose estimation and face alignment in which it traces out the facial expressions and forward the data points to Unity 3D to visualize it with characters.

**Vision towards goal:**

* Our mission is to automate any custom characters (Human + Anime ) in 3D.

**Research involves around the model:**

* We implemented this model for custom characters to visualize with the help of software (Unity 3D).
* Model is available in both the versions like GPU & CPU.
* Initially the model is available only on webcam functionality but we edited the model code and made it working on videos which divide the video into frames and process the frame in facial alignment with the help of 68 landmark.dat files.

**Implementation towards model:**

* We have set up all the necessary tools and models like head-pose estimation , face alignment and Unity 3D.
* We have tested with pre-trained files to automate characters on local with unity 3D which received the data through model code and transfer the data from one another with the help of socket to socket connect based on local IP address.
* After connection , we have to connect the demo file with unity 3D which gives us visualization in output.
* We have also approached this model for custom characters but for this we need to do a lot of morphing in unity 3d and with other softwares rather than rendering.

**Our strategy for model :**

* We need to set up all the modules in the current directory to make it work.
* Model is not generating any file but it is transferring the data from one module to another.
* We have also set up the module on local to make working with custom characters but it requires skills to develop and customize characters in unity 3D.

**Model setup:**

* Clone the model by <https://github.com/kwea123/VTuber_Unity.git>
* Go inside the model directory and install requirements.txt accordingly to your system hardware (GPU/CPU).
* You can also create a virtual enviorment where you can setup all your requirements.
* Now download the pretrained model check points and put it in the folder face\_alignment/ckpts.
* Now for final testing run the following commannd for results , if you are running the code in CPU then specify the same in command like
  + Python demo.py -–debug (add --cpu if you have CPU only)
* This model is workig fine with pretrained character which is already in the mdoel directory so to make it workking we have to connect with unity 3d for best rigging and output for this we have to run the following:
  + python demo.py --debug -–connect --cpu
* For connecting parallely you need to open unity character as well for working condition other wise it will not work
* For make it workig for custom character , we have to create the FBX file from unity 3d with proper rigging and morphing then only we will get the proper results.

**Limitation:**

*Model has different Limitation describes as follow:*

* Model is only worked on available characters mentioned in the link.
* The characters are only available in skeleton form which will not feel realistic in blender.
* For each character we need to download the FBX file from the link and convert into the required model format.
* For different characters we need to download the file and convert which is not possible in Ubuntu as software for this conversion is strictly based on Windows and MacOS.
* We need to convert the out file into mp4/avi format from blender which can not be done from our end and if we approach the same it will take a lot of time to convert for a single video.