MetaHuman Demo

1. **Download Unreal Engine**

- Ensure that you have a version of **Unreal Engine** installed on your computer that is compatible with **MetaHuman**. You can download it from the official **Epic Games** website.

2. **MetaHuman Creator**

- **MetaHuman Creator** is a separate tool from Unreal Engine that lets you design and customize digital humans. You can access it through the Unreal Engine Launcher.

3. **Acquire a face scan using the app "Polycam"**

- Employ the application "Polycam" to obtain a facial scan through the following methodological steps:
  a. Direct the subject's attention towards a specific object during the scanning process.
  b. Execute the acquisition under the **auto photo mode** setting, capturing an orbit at eye level, above eye level, below eye level, and several close-up angles. Subsequently, eliminate any images lacking focus to prevent the introduction of extraneous artifacts into the resultant polygons.
  c. Opt for the "**full**" option and refrain from utilising object masking during the processing of the acquired images.
  d. Upload the processed images for further analysis and processing.
  e. Upon completion, download and export the file in the **GLTF/GLB** format, ensuring a size within the **30-40** megabytes range.
  f. Transfer the file (e.g., through WhatsApp) to the designated computer for subsequent utilisation.

4. **Mesh prep in "Blender"**

- Perform mesh preparation within the "Blender" application with attention to the following steps:
  a. Import the mesh into Blender as a **GLTF/GLB** file.
  b. Conduct a comprehensive cleanup of the mesh, excising all extraneous components except for the facial region, while systematically eliminating any artifacts. Facilitate this process by navigating to **Edit Mode** and activating the **Toggle X-Ray** feature located in the top-right corner. Subsequently, select and remove undesired vertices using the "**C**" key for

assistance in vertex selection and the “**X**” key for deletion. The resultant output should be a refined and seamlessly contoured facial mesh.

c. Ensure the connectivity of all mesh components by entering **Edit Mode**, selecting the entire mesh using the “**A**” key, and executing the **Mesh Cleanup sequence**. This involves navigating to **Mesh** in the menu, followed by **Clean Up**, and executing the **Delete Loose, Degenerate Dissolve** and **Merge by Distance** operations.

d. After consolidating the mesh, designate the selection and export the file in the **FBX** format. During the export process, modify the “**Path Mode**” to "**Copy**" and enable the "**Embed Textures**" option by adjusting the corresponding icon adjacent to it. Select the "**Limit to**" option as "**Selected Objects**," specify "**Object Types**" exclusively as "**Mesh**," and deliberately deselect the "**Bake Animation**" checkbox. Adherence to these procedural steps ensures a refined and appropriately formatted FBX file for subsequent utilisation.

5. Metahuman generation (UE5)

- Initiate the Unreal Engine application and navigate to the **Film/Video & Live Events** section. Choose a **Blank** template, enable **Raytracing** by checking the corresponding box, assign a distinctive name to the project, and execute the project creation process, ensuring an appropriate storage location is selected.
- Access the **Edit menu** and proceed to the **Plugins** section upon project initiation. Select the **MetaHuman experimental plugin** (you might need to install the plugin from the Epic Games marketplace), acknowledging that Unreal Engine will prompt a project restart.
- Open the content browser by invoking the **Ctrl + Space** keyboard shortcut and establish a new folder under the "**content**" directory; for instance, designate the folder as "**FaceScan**".
- Integrate the 3D facial scan into the designated **FaceScan** folder by employing a **drag-and-drop** mechanism for importing all associated elements. Subsequently, insert the model into the scene and validate its placement through a scaling procedure.
- Within the content browser, click the **+Add** option in the top-left corner to incorporate the **MetaHuman Identity**.
- Activate the **MetaHuman Identity**, facilitating a linkage **between Epic Games** and the **MetaHuman Creator** website.
- Navigate to the **Components from Mesh** section in the top-left corner, locate the imported face scan, and introduce it into the scene.
- Ensure proper camera alignment by centering it at eye level. Adjust the Field of view to **15.0**, accessible through the three-bar button in the top-left corner of the scene, to achieve a visually "flatter" face. This adjustment is crucial for landmark recognition of facial structures.

- Opt for the **Unlit View Mode** to distribute lighting uniformly across the facial region.
- Select a suitable body type for the avatar by accessing the **Body** option in the top-left corner.
- Execute the actions of selecting **Neutral Pose** and promoting the frame. This operation locks the current frame for landmark recognition. Proceed to Track Active Frame.
- Apply artistic adjustments to the identified landmarks. Subsequently, initiate the **MetaHuman Identity Solve**, resulting in the generation of an avatar mesh. Utilise the "**B**" key to scrutinise the generated mesh, enabling a superimposition of both meshes for imperfection assessment.
- Conclude the process by clicking on **Mesh to MetaHuman**, transmitting the freshly created avatar to the MetaHuman website for further utilization.

6. Metahuman Creator (customization)

- Open MetaHuman Creator and start designing your metahuman by choosing various parameters such as age, gender, facial features, and more.
- Customize the character's appearance using the intuitive interface.
- Once satisfied with your metahuman, export it and save the files to your computer.

7. Live link face animation (UE5)

- Install the application **Live Link Face**, and upon initiation, opt for the **Live Link (ARKit)** capture mode.
- Facilitate the connection between the mobile device and the computer by accessing the **terminal/console** (press the **Windows** key + "**R**" Key, input "cmd" in the ensuing window). Execute the command "**ipconfig**" to retrieve the **IPv4 address**. Subsequently, navigate to the application's settings, and within the streaming options, incorporate a **new target**. Input the acquired **IPv4 address** in the designated field, ensuring activation of the **Head Rotation** option.
- Enable the **Live Link**, **Live Link Control Rig**, **Apple ARKit**, and **Apple ARKit Face Support** plugins.
- Integrate the **MetaHuman** into the project's scene by navigating to the **Window** menu and selecting **Quixel Bridge**. Within the ensuing window, access the **MetaHuman** tab, choose the desired character for download, and subsequently add it to the scene through a drag-and-drop action from the **Content Drawer**.
- Address synchronization challenges by selecting **Edit BP_(...)** under the **Outliner**. In the **Components** window, choose **LODSync**, and modify the **Forced LOD** parameter to **1**. Subsequently, in the top corner, click on

Compile and save to effectuate the changes. To resolve potential texture issues, input "**r.Streaming.PoolSize 8000**" into the **Console Command** located at the bottom of the screen.

- Establish the connection between the mobile device and computer by selecting the **MetaHuman** within the Details window, navigating to Live Link, identifying the relevant iPhone for the **ARKit Face Subj**, and activating the **Use ARKit Face** option.

Setup Animations and Interactivity (optional)

- Utilize Unreal Engine's animation and blueprint systems to create movements and interactions for your metahuman.
- You can use pre-built animations or create custom animations using tools like the Animation Editor.

Programming (Optional)

- If you want your metahuman to perform specific actions or respond to events, you may need to write Blueprints (visual scripting) or use C++ for more advanced functionalities.

How to create your MetaHuman
https://www.youtube.com/watch?v=7lAWhk_aVvc

Live link face animation
https://www.youtube.com/watch?v=rFKXFdtCrfA

MetaHuman animator tutorial
https://www.youtube.com/watch?v=hZ2mkcd4C7M