

## Character Rigging and Animation

### Rigging Wheatley

Unlike a lot of humanoid characters, Wheatley is a spherical character that is supposed to roam around via rails. Therefore, we can't expect standard armature rigging (2 hands, 2 legs etc.) to work out of the box with our mesh. Instead I started with a new skeleton from scratch and tried to attach it to appropriate parts of the mesh with the help of few online tutorials [1, 2, 3]. However, even after spending a lot of time (nearly 2 days) to correctly rig Wheatley, I found out that we can use Source Film Maker (SFM) [4] – an official tool by the game developers to import our model from the game. This tool has fully rigged characters from the game and allows exporting these fully rigged characters to Blender. Therefore, in the interest of time, I simply took armature rigging for my character from SFM.

### Animating Wheatley

I started by uploading the rigged character on Mixamo. Then I used [5] – a VFX breakdown of animating other cores from Portal 2 as my reference and inspiration for my animation. I also prepared a far more detailed version of my animation sketch with dialogs extracted from the original game. This extracted audio and the animation sketch is also uploaded on the repo under relevant folders. My final animation will be about a minute long. I have animated a short 10 second clip out of it where Wheatley is just idle and looking around my room. After the animation was completed on Mixamo, I imported it in SFM first and made sure that it looked okay with respect to other elements of the game. I did few tweaks (mainly with speed and scale) to the animation in SFM and then exported the .smd animation file. This can be imported into Blender and applied to the rigged Wheatley with the help of “Blender Source Tools” [6].

After this, I plan to complete other parts of animation (laughing etc.) independently of each other with the help of Mixamo and SFM and then apply them in Blender with the help of NLA (Nonlinear Animation) editor in Blender.

### References

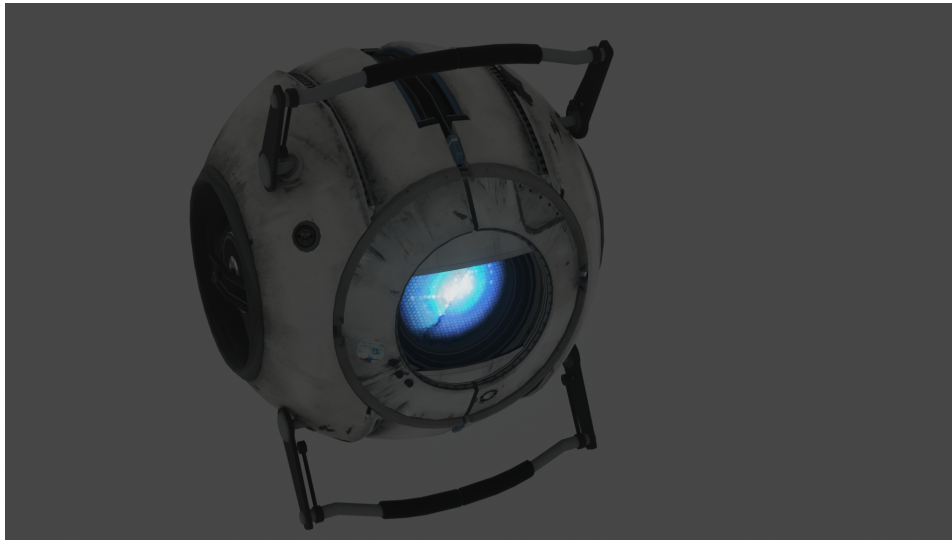
1. Character Rigging for Beginners (Blender Tutorial) – <https://www.youtube.com/watch?v=mYgznqvbiSM>
2. Simple Rigging In Blender – <https://www.youtube.com/watch?v=EVBseo4YLa4>
3. Rigging Characters in Animation – [https://www.youtube.com/playlist?list=PLL3OEv6vd5VA8\\_FBkeitaeqC0kbcrhMTC](https://www.youtube.com/playlist?list=PLL3OEv6vd5VA8_FBkeitaeqC0kbcrhMTC)
4. Source Film Maker – <https://www.sourcefilmmaker.com/>
5. Portal 2 - Meet The Cores - VFX Breakdowns – <https://www.youtube.com/watch?v=a0W98bSAuxY>
6. Blender Source Tool – [https://developer.valvesoftware.com/wiki/Blender\\_Source\\_Tools](https://developer.valvesoftware.com/wiki/Blender_Source_Tools)

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## Character Choice and Augmentation Plan

### Character Choice

I am choosing the character “Wheatley” from the game “Portal 2” for this assignment. “Wheatley” is an “intelligent personality core”. These are purpose built (therefore having a distinct personality) robots with spherical shape that can attach to and control any electronics in the game. More info about this character can be found here – <https://theportalwiki.com/wiki/Wheatley>. Despite a somewhat simpler geometry, these personality cores can convey a lot of emotions as shown in this clip from the game – <https://www.youtube.com/watch?v=rWVGupqvCL8>.



**Figure 1:** Wheatley’s mesh extracted via the official copy of Portal 2 and imported in Blender

## Animation Plan

For my video, I plan to start with a shot of my laptop that has a “Wheatley” wallpaper. In the first part of my video, I close my laptop and put that in a bag. Then as I’m leaving the room, “Wheatley” appears on my table (as if he just escaped from my wallpaper) and attempts to start a conversation. Then the entire video will be me moving my camera around the table to escape the conversation and capture him somehow in the laptop again. The main challenges in animating this character will be getting the expressions right by moving appropriate parts of the sphere. As can be seen from the video linked above, each layer of the spherical robot along with the handles can be animated. Each of the parts move very subtly to create a convincing emotion. Getting that right will be challenging.

## Character Mesh

To get the character mesh, I simply used my own copy of Portal 2 I own through Steam (the official distribution mechanism). Assets extracted in this way are allowed to be used in non-commercial projects and therefore this should not be violating any copyrights. The mesh consists of 2 (upper and lower) handles, the outer shell, the inner sphere and the 2 “eye” lids. The inner sphere has 3 degrees of (rotational) freedom while every other part has upto 2 degrees of freedom. Refer to the figure above and the aforementioned video to see these degrees of freedom in action.

## References

1. [https://developer.valvesoftware.com/wiki/Blender\\_Source\\_Tools](https://developer.valvesoftware.com/wiki/Blender_Source_Tools)
2. [https://developer.valvesoftware.com/wiki/Animation\\_in\\_Blender](https://developer.valvesoftware.com/wiki/Animation_in_Blender)