Mech arm

2.1 Advanced and Experimental 3D Computer Animation Techniques

Tingyi Huang

[1] Introduction to the project:

►Brief:

For this project, I suppose to create and design a mechanical arm following Nick's tutorial in Maya and composite the arm into live-action footage.

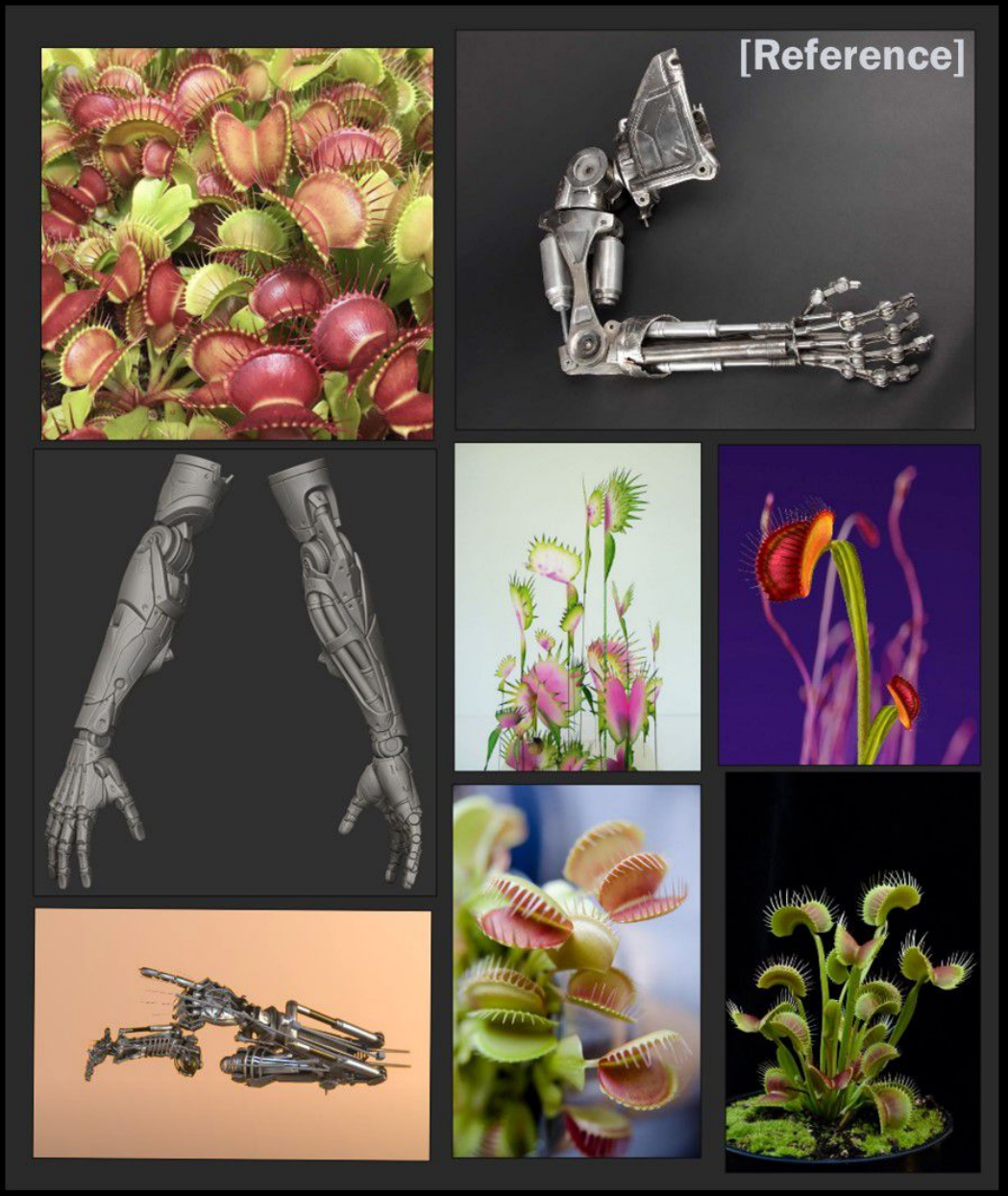
►The whole task includes 6 process:

Planning and design-Modelling-Rigging-Animation-Rendering-Filming and compositing.

[2] Design the mech arm

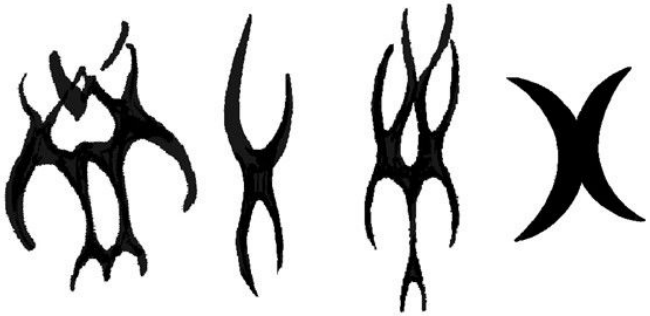
►Idea: Naturalistic mech arm

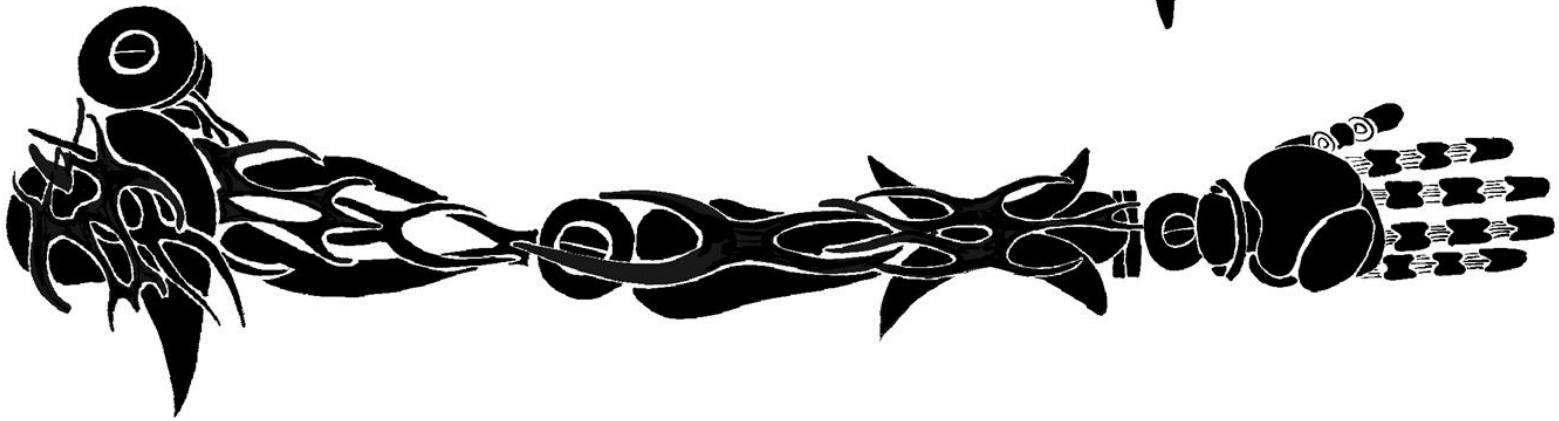
I want to create a naturalistic looking for my mechanical arm because I think it is interesting to blend the idea of nature and machines together. A lot of design in life actually comes from nature. One example is the sharkskin swimsuit. Shark skin has a texture that can reduce drag in the water, allowing swimmers to move more quickly.



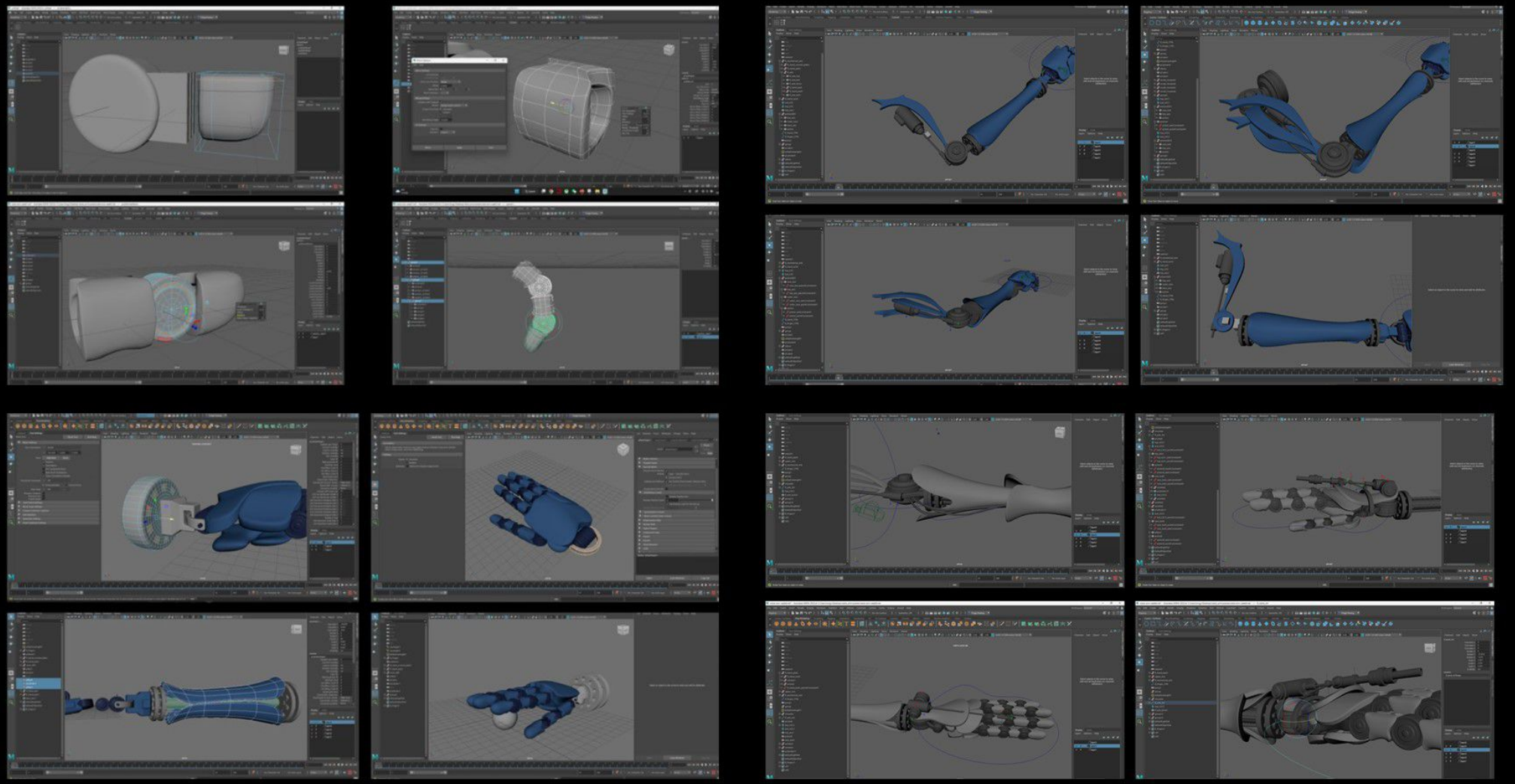
►Design:

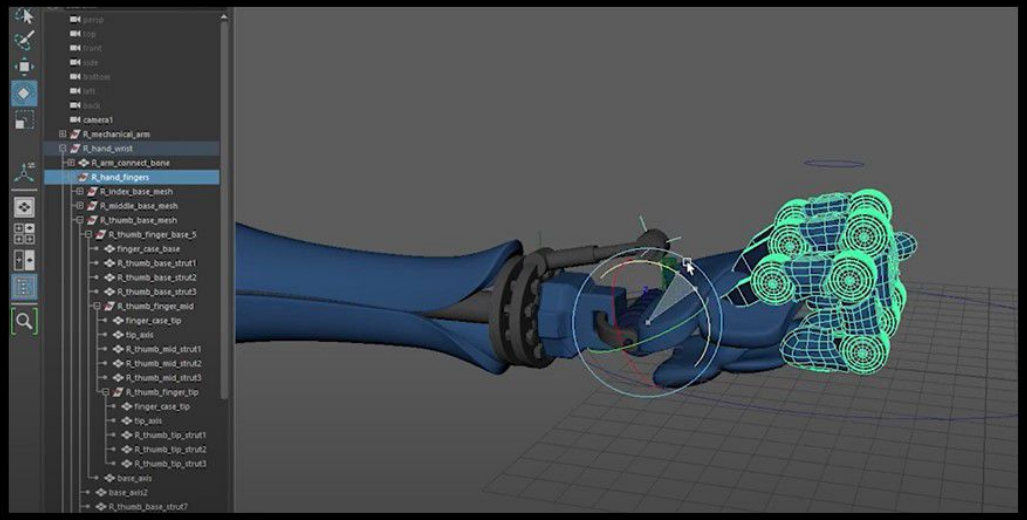
Inspired by Venus flytrap

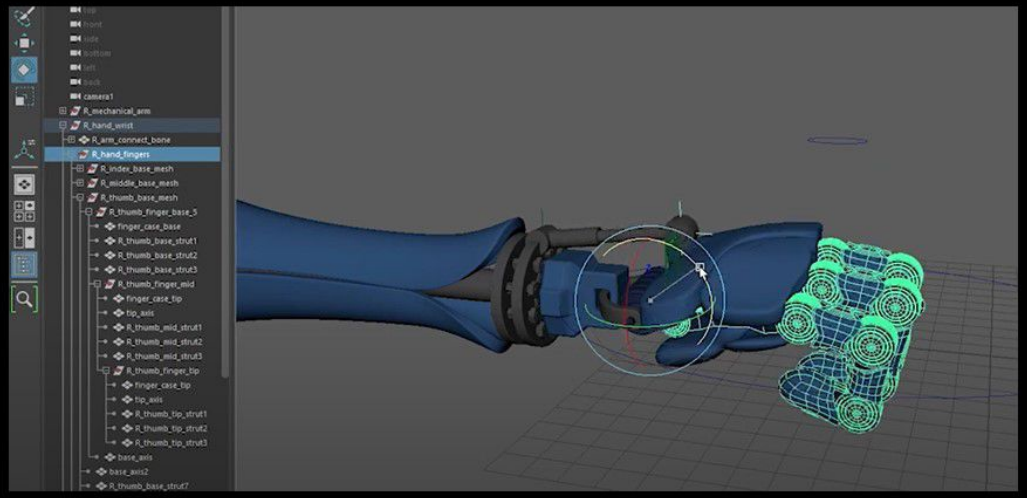




[3] Modelling:







[4] Rigging

► Types of constrain:

For the rigging, I use different types of constrain to rig the mechanical arm. There are three types of constrain in total:

- **aim** constrain—control the rotation
- **point** constrain—control the translation
- **parent** constrain—both the translation and rotation

► The basic Process:

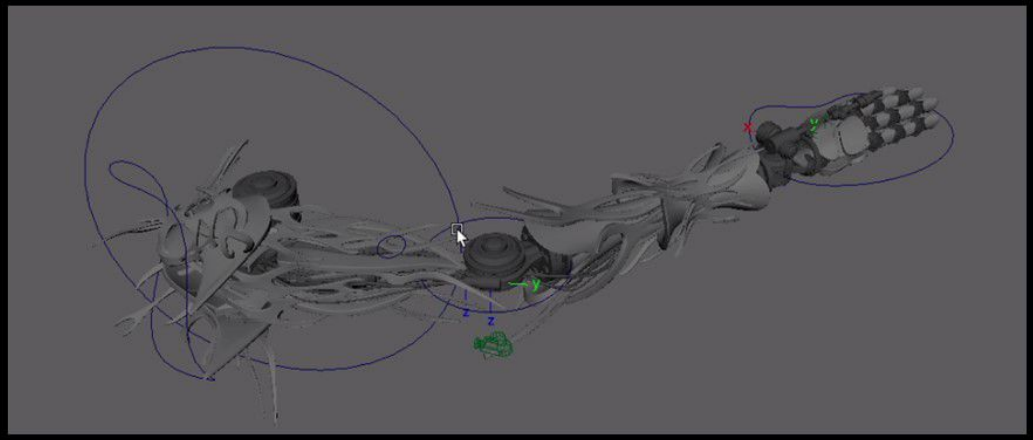
Use aim constrain to create control between the locator and the pipe.(1) Then, use point constrain to create the popping animation between the pipes. **last, create parent constrain between the top axis and top locator(2)**

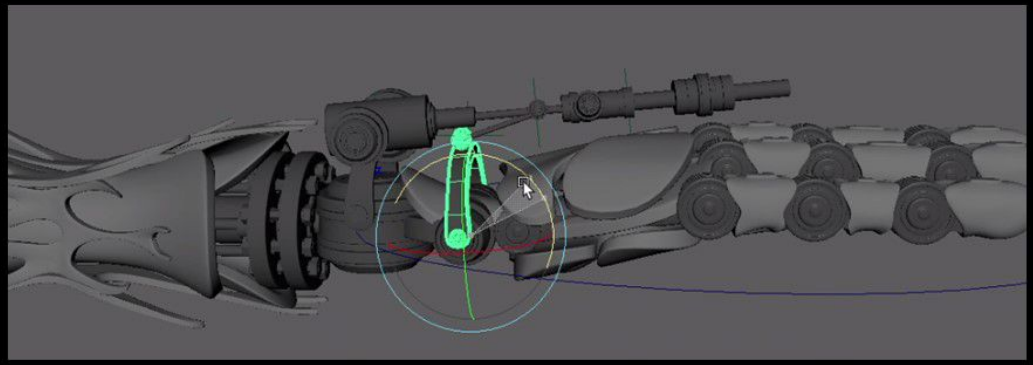
► Arm rigging:

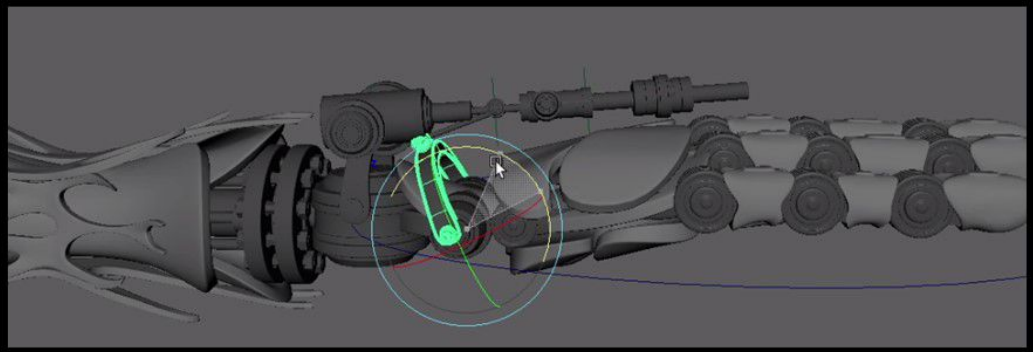
After finishing the constrain on the small objects. I simply create a parent constrain between the controller for 他 the elbow and forearm. Then I create **parent constrain** between the shoulder and upper arm.

► Finger rigging:

For the finger, I use **set driven key** to animate it. Though there was a class about it last term, it is still a relatively new way for me to animate. I think it is very useful in lots of situations. It's very clean and not so hard to set up.



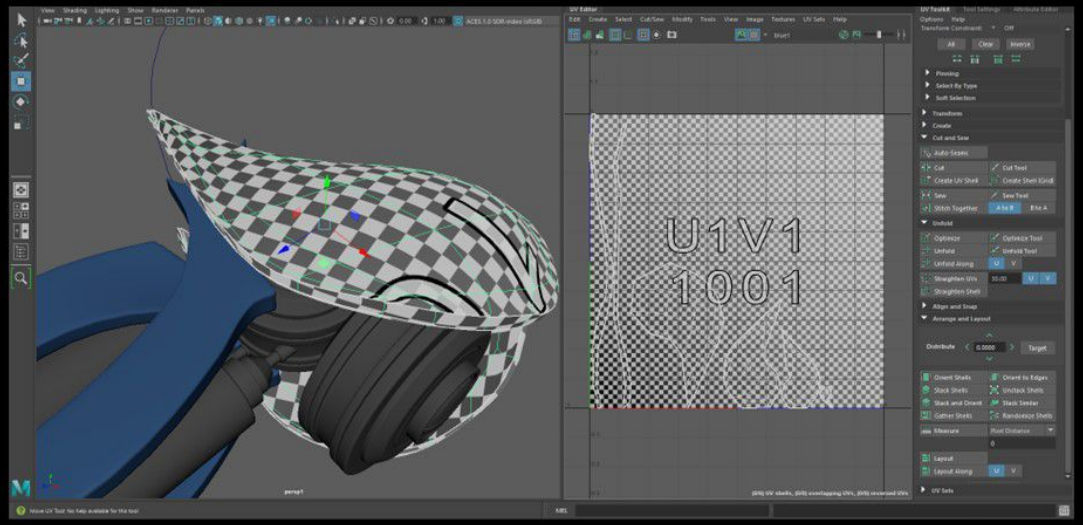


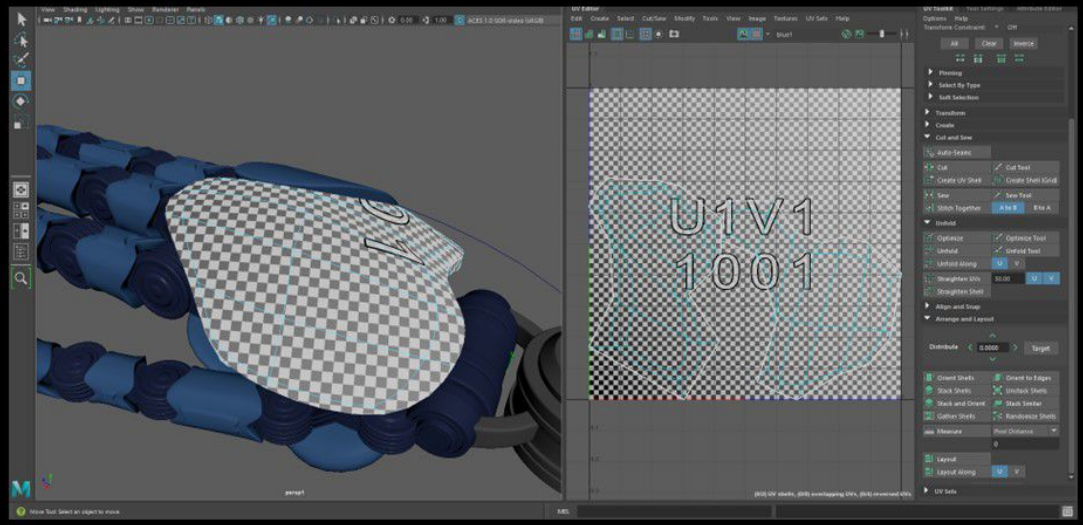


[5] Rendering

► Texturing:

There are two ways to do the texture here. One is using Substance Painter to paint it following the UV map. The second way is using a node to do the texture. For this project, I think it is better to use nodes for texturing.

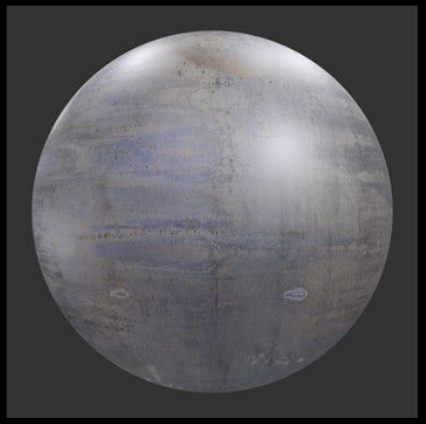




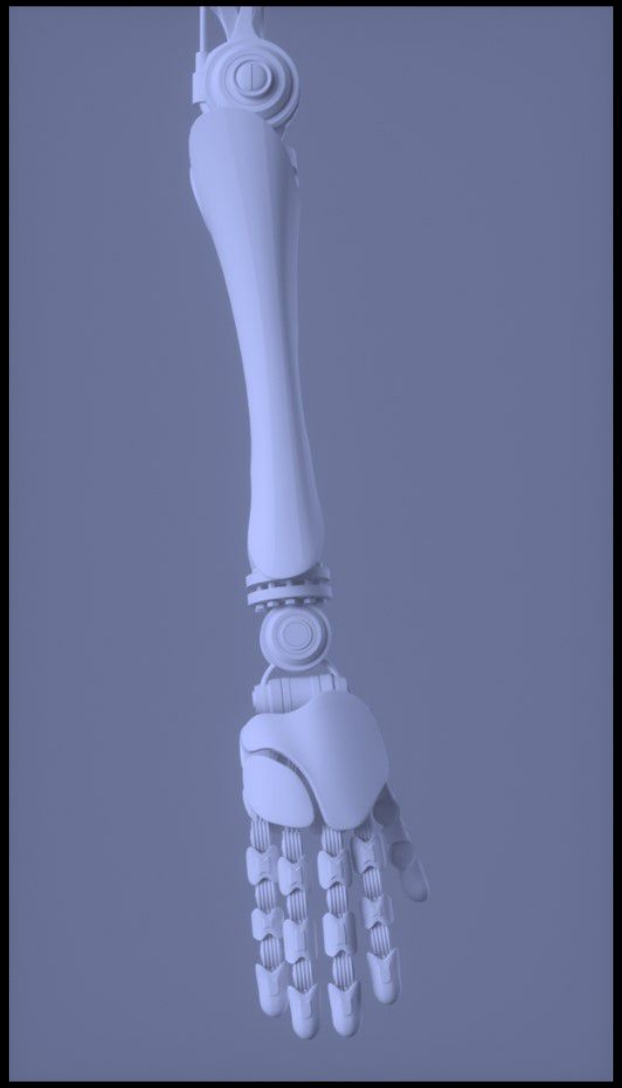
► Texture inspiration

[Art by Mony Pich]

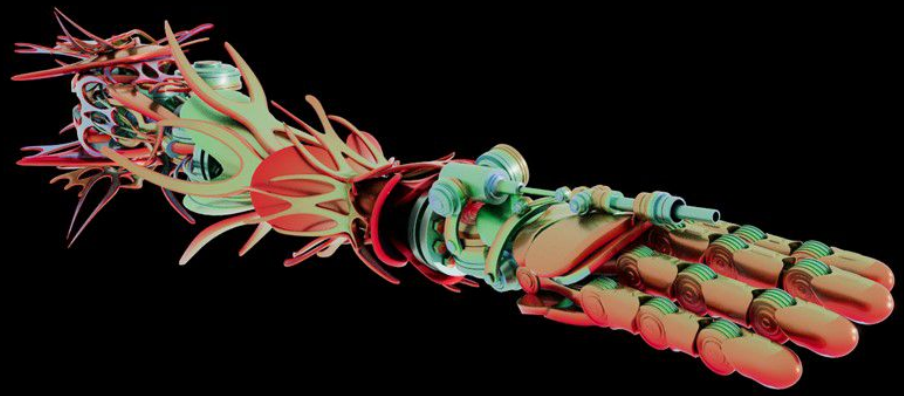
I did some experiments on the texture as well to find the best visual I wanted.

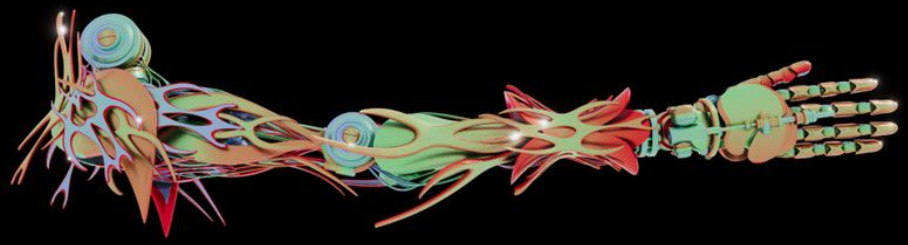


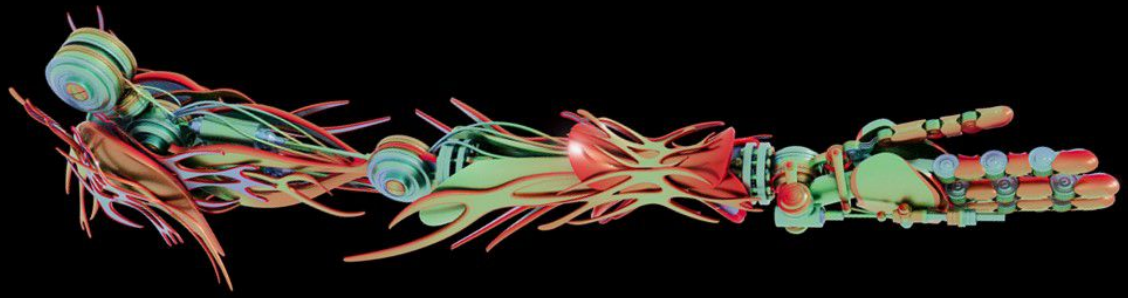
▶ First render

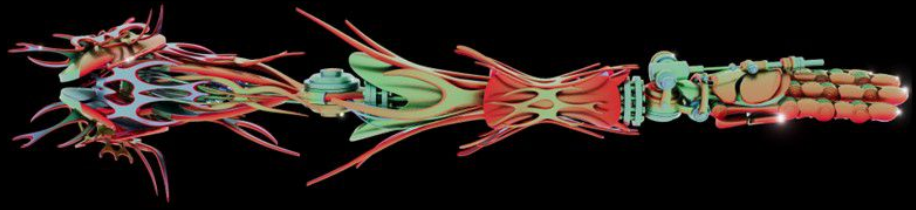


▼ Second render









[6] Compositing

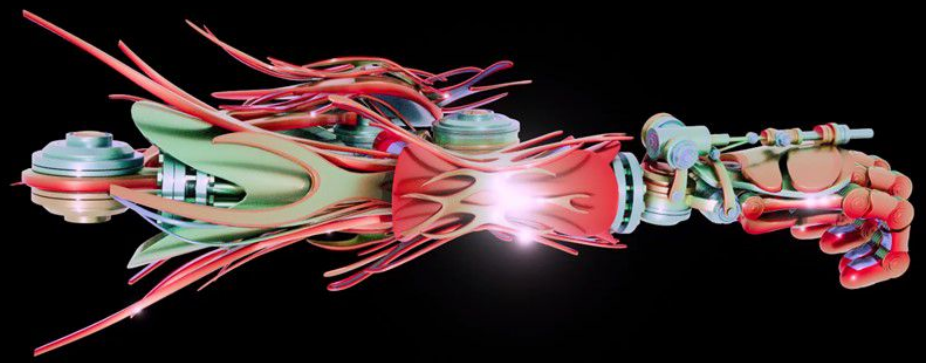
►Filming :

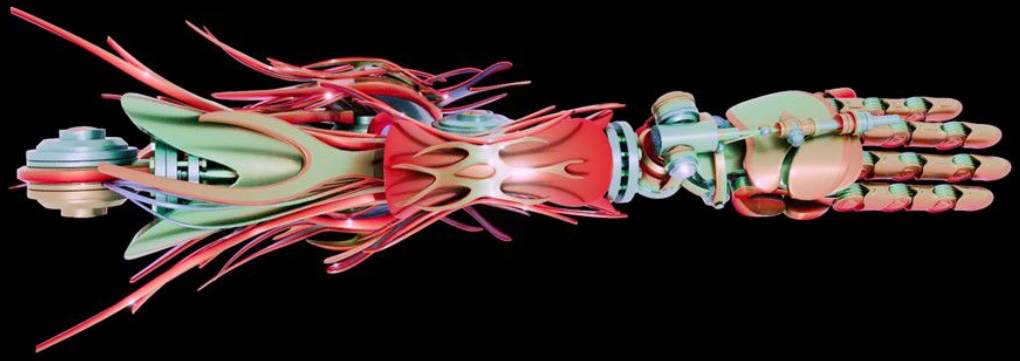
I filmed the video and used premiere pro to take out the green gloves. I used the "Ultra Key" effect and selected the colour to remove the gloves.

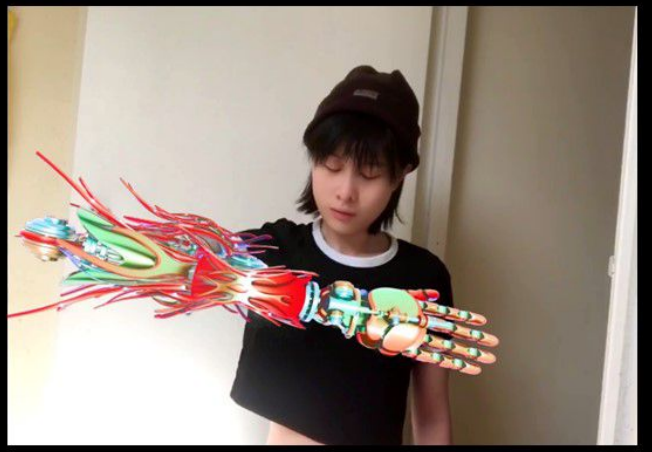
Instead of exporting the video from the alpha channel, I used the luma key to take out the black background.

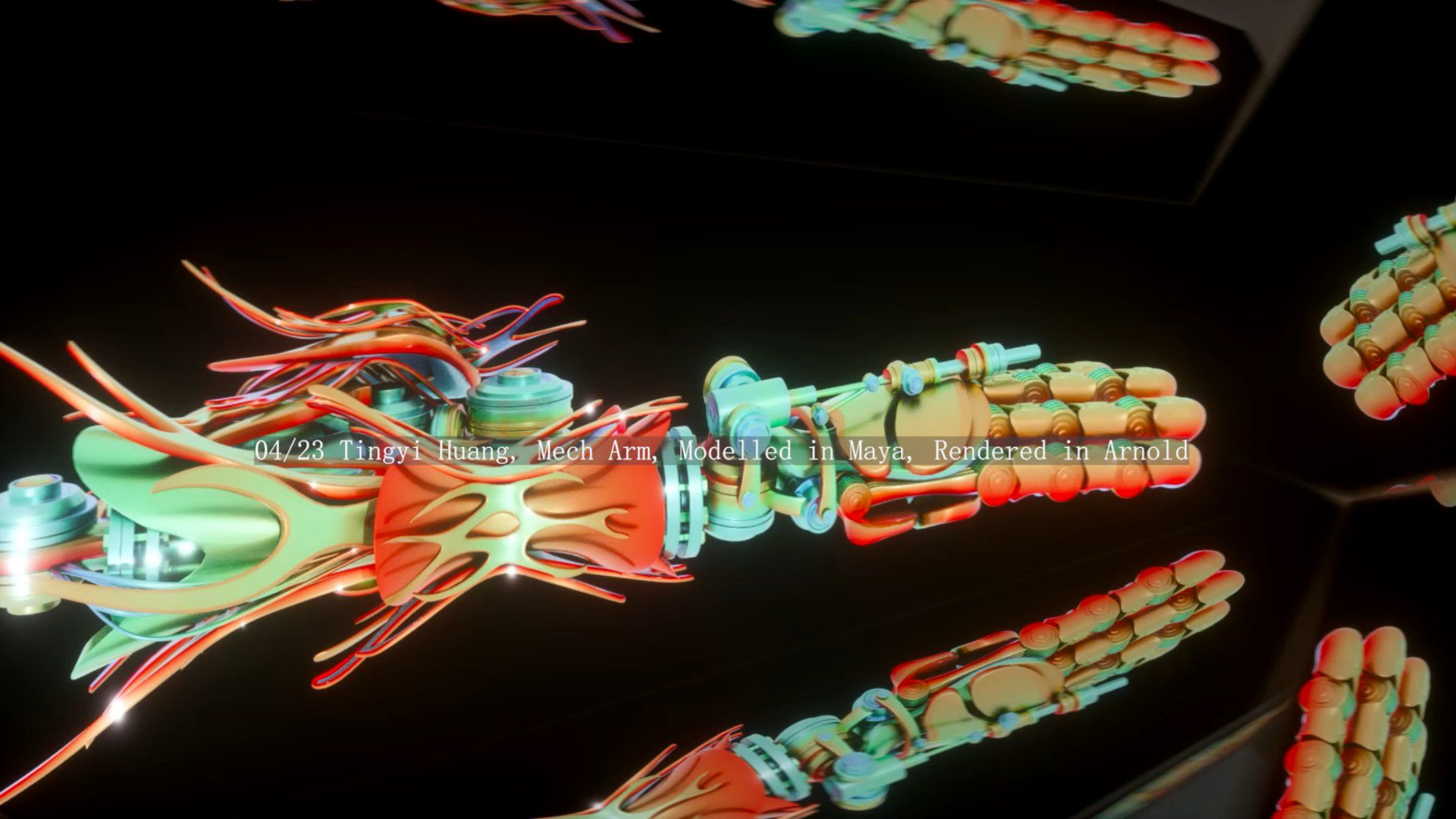
▼

▼ Compositing





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