Project A: Two traditional Chinese weapons

Section1: Goals

- Creating several distinctive, animated and jointed 3D shapes, and ideas of shapes come from life. The motivation for creating the sword and the whip was these two objects are cool and have complex structures, which will help me to understand the features of the WebGL.
- Adding mouse interaction and keyboard interaction with these 3D objects. User can adjust the position of the sword by double click the mouse and drag mouse to move the whip. And users can adjust the speed of the movement by pressing the buttons under the canvas. It is a good way for me to be familiar with the usage of JavaScript.

Section2: User-guide

Instructions:

There are two traditional Chinese weapons here. One of them is a big sword and the other is a long whip. They are very powerful, and they have different usages. Now, I will show you how to use them.

1. The whip:

As you can see, the color of the whip is changing over time. And the shape of the whip handle is also changing over time. Besides, there existed more than 20 sequential, moving joints in the whip.
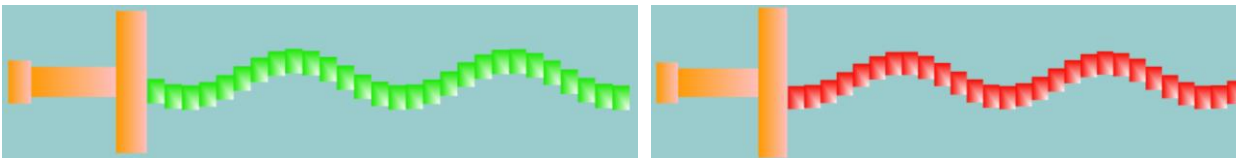

Figure 1 The color of the whip is changing over time

Figure 2 The shape of the whip is changing over time

The position of the whip also can be controlled by the mouse. When you drag the whip, its position will change along with your mouse.

2. The sword:

There existed three buttons under the canvas. When you click the button "speed", the speed of rotation of the sword will change, and when you click the button "Run/Stop", the rotation of the sword will stop or begin.

You can also realize some special effects by the keyboard input.

When you press the D key, the sword will open. But you should notice that please make sure the distance between the two parts of the sword is far enough, otherwise the hidden weapon will not be able to shoot.
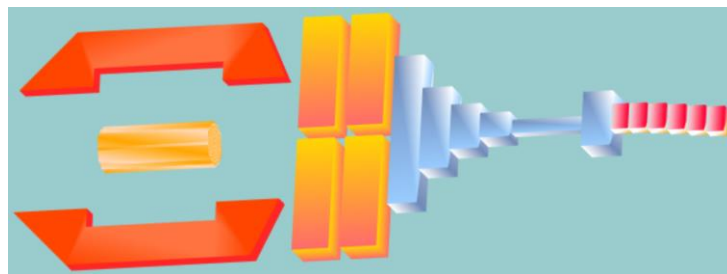

Figure 3 Two parts of the sword were split

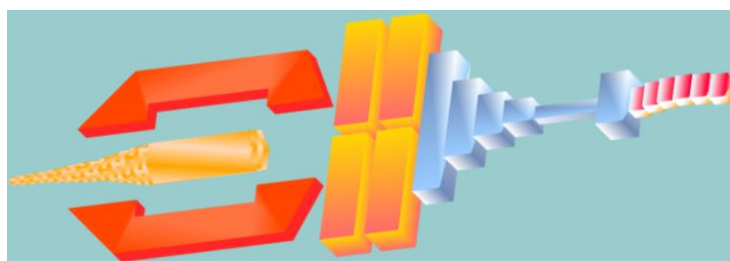When you press the W key, the hidden weapon will be shoot.

Figure 4 The hidden weapon was shot

When you press the S key, the hidden weapon will be recovered. You should notice that please make sure the the hidden weapon was recovered completely, otherwise the sword will not be able to recover.

When you press the A key, the sword will be recovered.

Like the whip, you can change the postiton of the hilt by mouse, when you double click the mouse, the hilt will move to the position of the mouse.
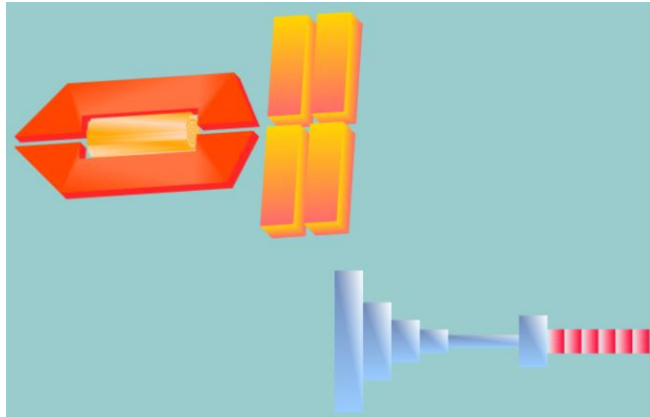

Figure 4 The position of the hilt was changed

Section 3: Scene-Graph

Below is a scene-graph diagram of this project. The nodes labeled with T mean a matrix translation. Those labeled with R mean a matrix rotation. Some have T, R which means translations then rotations.

The blue one represents Group Node, the red one means Transformation Node, and the rightmost ones refers to Object Node.
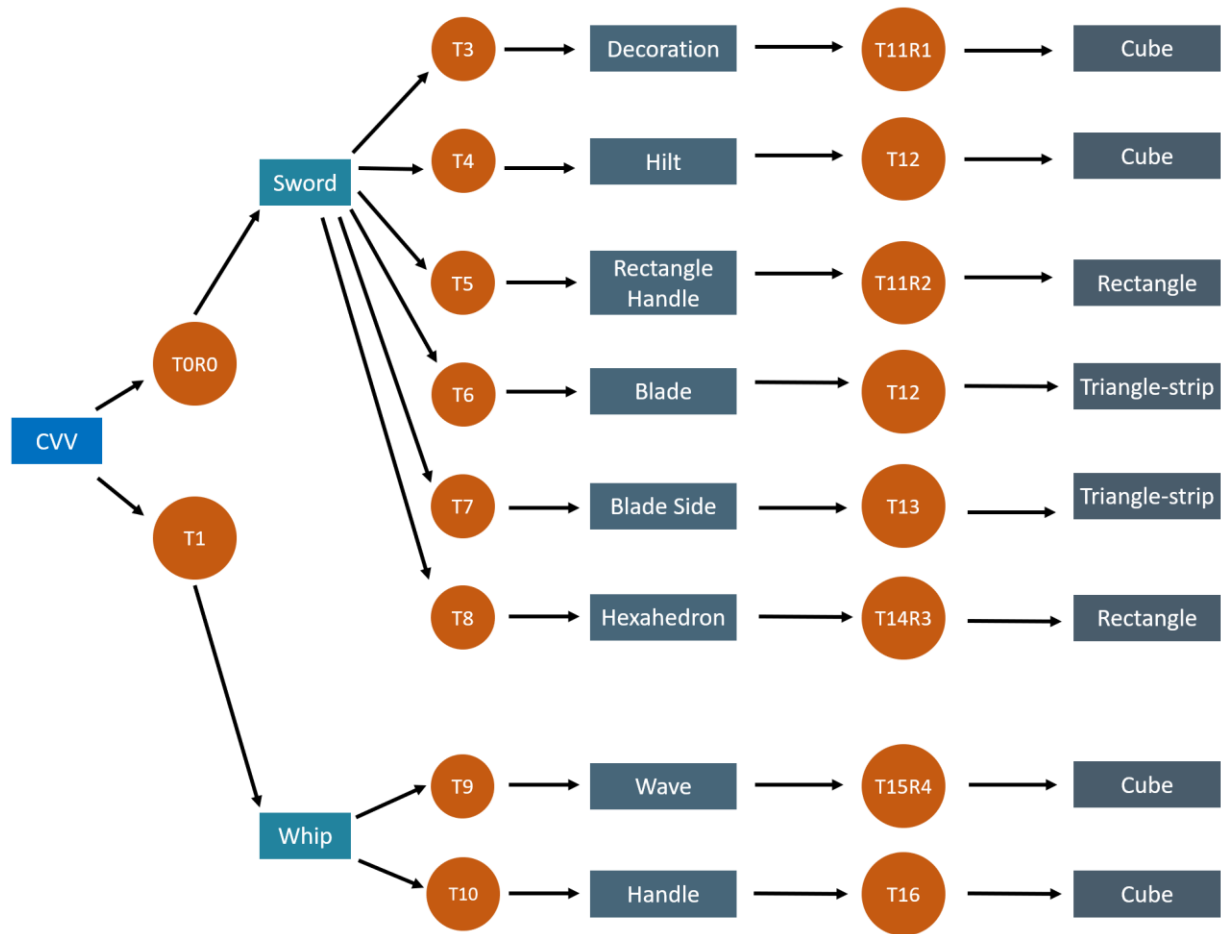
Figure 5 Scene graph