Project 6

CS 557 - COMPUTER GRAPHICS SHADERS

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Project Number: 6
Project Name: The Cat Menagerie

Video Link: https://media.oregonstate.edu/media/t/1_swl66nts

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What I did:

I did the typical NPR stylization named Cartoon stylizing and I also did some Cartoon effect for a famous manga named Naruto. Basically, there are three steps that I did:
   1. Silhouette Extraction.
   2. Light Effect Discreteness.
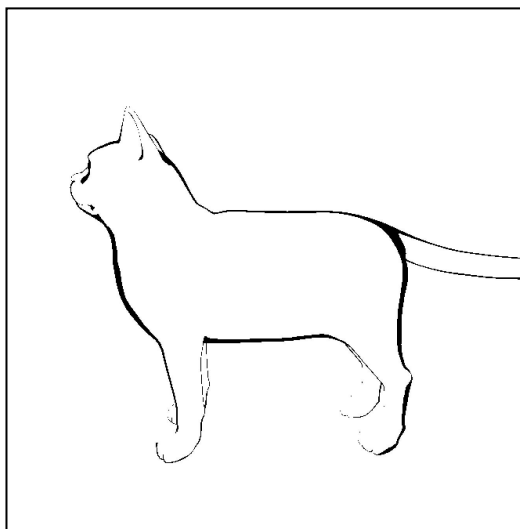   3. Art Processing.

How do I did:

Step 1 *Silhouette Extraction*： For this part, I did two experiment for two ways.
The first way is using the geometry shader for dot product comparison between each two faces, which can be seen as below:
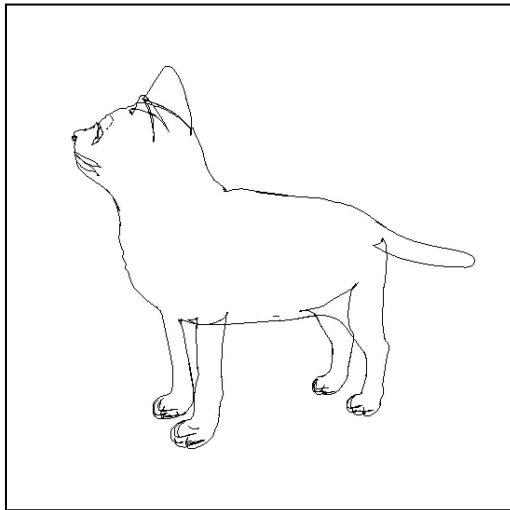
The second way is directly compare the dot product result in the fragment shader for each pixel in the scene, which can be seen as below:

Obviously, I will chose the second way for the Silhouette drawing for the smoother and thicker contours.

Step 2. *Light Effect Discreteness*:

I did this by setting the discrete threshold for the dot product between light and the normal.
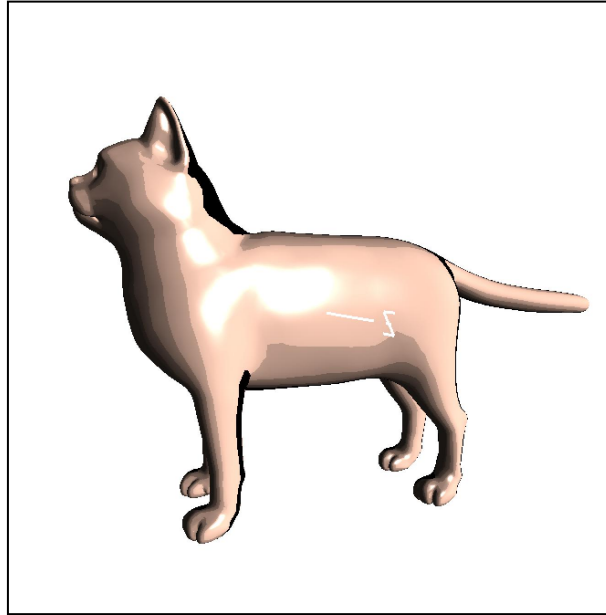
```
float df = dot(Normal, Light);
if (df < 0.1)
    df = 0.0;
else if (df < 0.2)
    df = 0.2;
else if (df < 0.4)
    df = 0.4;
else if (df < 0.6)
    df = 0.6;
else if (df < 0.8)
    df = 0.8;
Else
    df = 1.0;
```

The result can be seen as below:
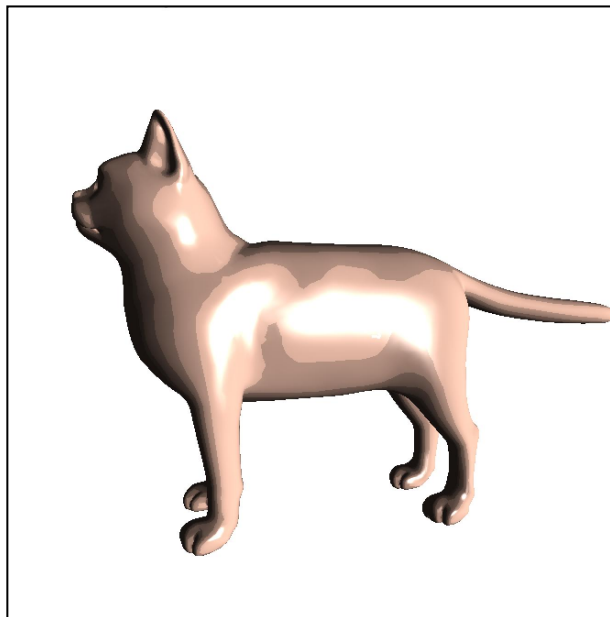
Step 3. *Art Processing*:

At this time, we combine the effect of the silhouette with the discrete lighted surface, then we get:

Finally, we give the cat with a transparent cover by draw a new cat whose vertices is increased in the direction on the normal. The final result can be seen as below: