CS550 Final_Project

Chih-Hsiang Wang
wangchih@oregonstate.edu

Fountain

Proposal

I plan to build a cool fountain because I am so much fond of watching it! To build the fountain, I need to study particle system first, which I browsed for a while and felt confident that I can accomplish it within the next few weeks. The effect of splash is too difficult that I will not implement it in this project.

The fountain also comes with a special pedestal that I plan to apply what I learned on it. Including but not limited to GLUT, transformation, shader, light, and texture. The final draft is still in design because I need to balance between my imagination and possibility of implementation. I prefer jumping right into the project and modify my design based on the inspiration and difficulty.

If time permitted, I will implement a nice environment to make the fountain look better. Maybe the spotlight, rainy day, fireworks, and much more. Different keys can change the environment and the splash from the fountain. Nonetheless, it means I need to study more materials to get some of the cool effects, which related to time allocation between my subjects.

After about three days of conception, I came up with this idea while many cool ideas were abandoned. They are really awesome but probably exceed my ability too far. Since I pay much attention to the aesthetic feeling, I will try everything to not disappoint myself with the final product

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What I did

1. By using my project4 template, I was able to reduce time on building the basic design environment.

2. I used five torus each with six laterals to combine the pedestal of the fountain. To my surprise, the effect was much better than I thought that I canceled my prior intent to apply texture on it. (picture 1)

3. Now, it came the most difficult part, simulating the particle effect of water splash. I went on Internet trying to find some useful tutorials and materials. It was harder way beyond my imagination. The sources were either too complicated to implement or using different interface. After days of searching along with try and error, I successfully built the particle system.

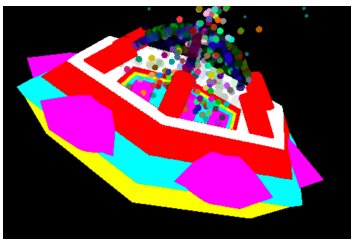
4. The particle system includes instancing, fading, friction, and lifetime.

5. I think the most cumbersome task for the particle system is the parameter. Because I did not know the physics behind the system so well, I kept trying and looking for information to fill the missing pieces in my particle system.

6. With the particle system, I simulated three effects, which were water splashed up from the center of the fountain, water splashed from the canons, and the snow falling down.

7. I made six canons to shoot out particles.

8. Because implementing the splash effect is beyond my ability, I used random color to make the particles look nicer. To be noticed, there are eight particle object for all the particle effects that I can modify the parameters separately. However, the code looks redundant and I do not have much time to refine it for now.



picture 1

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Difference

In my proposal, I wrote that I planned to use the shader, light, and texture but did not implement in the actual project. The reason for not using texture was explained before that I thought my pedestal was good enough without texture. As for not using the shader, it is because I was not very familiar with it and will be better knowing it after taking shader class. I tried some light effect in the beginning, however, it happened to me that I could not make the light on particles well.

The environment I made is the scene of snowing instead of raining in proposal, since the fact that I thought snow with the fountain was more romantic. Doing fireworks is a cool thing, besides, it seems not that hard to implement while I already have the particle system. But it may take a lot of time on designing the parameters, so I chose not playing with it for this project.

Cleverness

People can see my delicate design about the pedestal and particles, because I tried different parameters many times to make them better. The combination of colors of the pedestal, shape of the pedestal, size and speed of particles, and colors of particles, were designed many times until I felt content about the outcome.

The usage of random function to produce particles and colors was an impressive design to elevate the aesthetic view. It made up the shortage of splash effect.

Overall, the result of my project almost accorded with my conception of the proposal. Most of all, I thought the fountain is really beautiful and cool!

Learn

I know how to build a particle system from the scratch. Besides, I became more familiar with each function and category that I learned before. Another important thing I learned was that, material about openGL was not as much as I thought it would be or the methods were deprecated. As a result, I need to seek for further knowledge and tools to accomplish works about graphics in the future.

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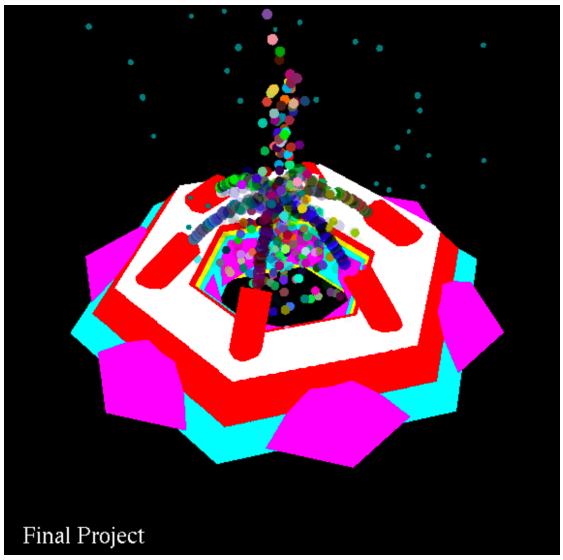
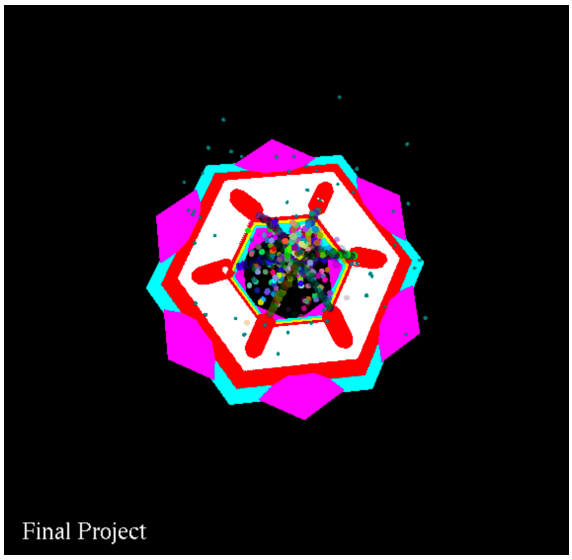
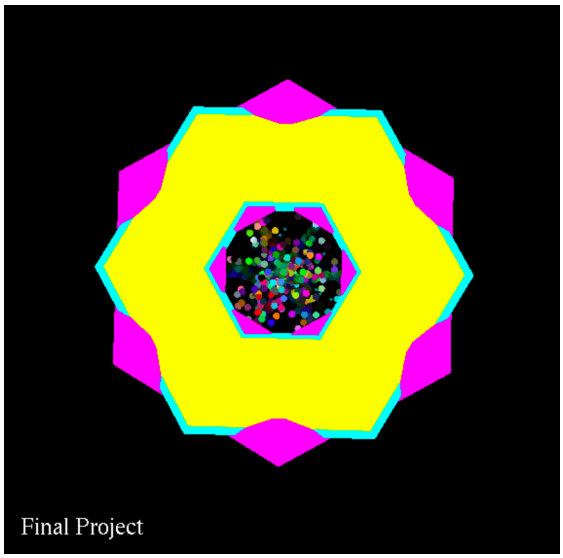
Image



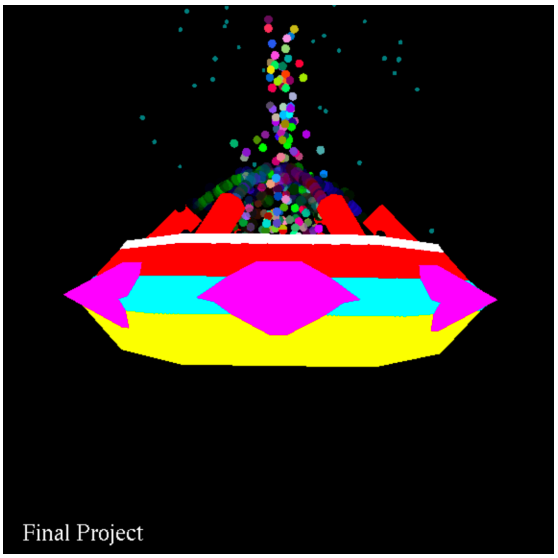
Initial view



Top view



Bottom view



Side view

link of video

https://media.oregonstate.edu/media/t/1_8ilm0dc9