

CATHEDRAL

Documentation for the Creation and Animation of an Interior Scene

For me, the goal of this project was to create something that looked good and realistic, without dedicating every waking moment to the job. Furthermore, I had only brief experience with 3d-modeling going so keeping things simple was also key. The idea was to construct a scene and later a movie clip that was compelling, yet created using relatively basic techniques.

Luckily, when I had dabbled in 3d modeling in the past I learned a very important thing: architecture is both very easy to create, and looks good from the very beginning (even without textures and only the most basic lighting). My general course of action had been set. Upon further thought I decided that an interior scene is better than an exterior, since there was no need for a surrounding environment and lighting could be manipulated to create the desired atmosphere.

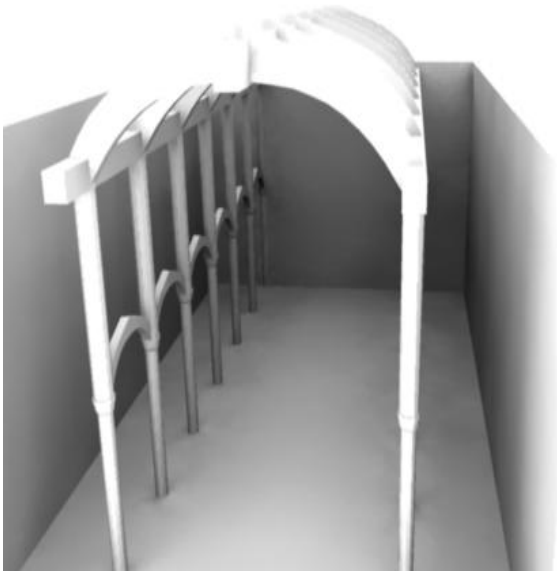
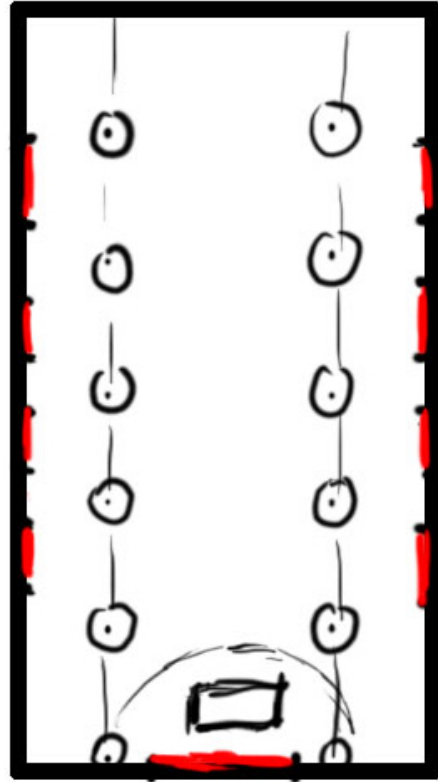
Modern architecture tends to not be particularly interesting to look at, and ancient (Greek and Roman) structures seemed to generic for my tastes. I decided to go with something gothic, and very soon the idea of a cathedral interior came to me. This also presented another interesting point: if I could somehow create convincing stained-glass windows, the scene would become far more interesting than just a regular interior.

Next I went online to locate resources, some examples of which are pictured. Luckily reference material was plentiful, both in the form of interior photographs and floor plans. Granted, the finished piece is not as grand as a real full-sized cathedral, but the basic structure is there.



From the references I found I sketched a basic floor plan, and began modeling. The walls and columns were quickly in place, followed by arches. 3D modeling programs make it very easy to duplicate objects and position them based on values, which makes them perfect for visualizing architecture. With just a few shapes it is easy to quickly construct a very complex scene.

At this point I did a few test renders. However, to make everything truly look good I needed something more than just default lighting. Luckily I knew a few tricks with the Mental Ray rendering engine in Maya: it is possible to create very convincing lighting using Final Gather, and placing the entire scene in a large, white sphere. The sphere is essentially a giant light source that Final Gather uses to calculate shadows and reflections. A quick test yielded the following:



Needless to say, the lighting looked good. Note that in this version there is no roof, the final had a roof added while still having no back wall (if you look carefully at the finished piece, you see bright white light reflected off the columns and arches).

A few more objects were added at this point, and it was time to start working on the windows. For the most part, the stained glass effect was done using textures. The large window on the back wall was a high-resolution image that I was able to find online.

The windows along the walls are all pieces by the artist Richard Kane Ferguson, whose style somewhat resembles stained glass. A few minutes in Photoshop turned the images into rectangular textures ready to be applied to the windows. An important thing to note is that the light from the windows is not actual light coming from outside but rather the window material's Ambient Light setting turned up. This is not the best way to this, but it achieved a very nice glowing effect with relative ease.

The next step was to find some textures for the walls, columns, and floor. Highly reflective marble was used for the floor, arranged in a checkerboard pattern. This nicely reflected the columns and windows – a very simple technique, but it adds greatly to the scene. Bricks were used for the walls, and marble for the columns.

Finally, it came time to do animation. I knew I was going with a relatively simple fly-by, which I realized could represent a bird flying around inside the cathedral. Suddenly the large stained glass window with the countryside scene (which had originally been chosen randomly) became very important: the bird would fly through it, thinking it to be real. This tied the whole thing together, and after some time tinkering with paths and cameras the scene was ready to render.



The rendering itself took roughly 12 hours, the animation being 450 frames long. The final clip was imported into iMovie, and sounds were added. The choice of music was pretty straightforward: this was a cathedral, so some choir-type singing would fit perfectly. The particular piece I used seemed appropriate, since it was only one voice singing (just as there was one bird flying). The echoes in the singing greatly enhanced the atmosphere of a large, empty space. Finally, the sound of shattering glass was added to the end to signify that the bird had crashed through the window. Notice that there is no shattering animation, but the effect is achieved fully with using only sound (and an appropriate transition from iMovie).

In the end I am happy with how the scene turned out. There are many things, of course, that I would like to spend more time on and improve. For instance, the texture on the walls looks somewhat out of place, and it would be good if light actually passed through the windows (creating all kinds of cool effects due to the reflective surfaces). The marble of the arches and columns is too reflective (something that I unfortunately noticed only after the final render was complete). Originally I was going to create my own custom stained glass window for the main wall, but this was abandoned due to time constraints (and the fact that the current version happened to fit well with the scene). In the future I plan to continue working on this project, perhaps to eventually make it more closely resemble my original vision.

