

CS148 Final Project Report

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Inspiration

I was inspired to create a final project based on the beautiful Clementinum library in Prague, which I had the privilege to visit earlier this year.



As an avid reader and lover of libraries, I want to capture the classic, antique vibes of this gorgeous Baroque library. So for my final project, I chose to pull some elements from the Clementinum library, namely the gorgeous ornate globes (specifically the left-most one with the glass half-dome), and combine them with the cozy aesthetic of a library desk pushed against the window.

Final Image



Project Requirements:

Leveraging the power of ray tracing:

I leveraged the power of ray-tracing by using a combination of an HDRI to provide realistic lighting, with area lights, to provide specific lighting to the desk as well as to illuminate the rest of the library interior. Furthermore, I utilized volumetric rendering and an area light to create god rays, to show the light streaming in through the library window. I also leveraged ray tracing by my use of transmissive materials, including the magnifying glass on the desk, as well as the glass half-dome on the Clementinum globe. The glass half-dome on the globe transmits shapes and colors from the HDRI background, and shows how light rays are warped by travelling through glass. The magnifying glass shows how the shape of a glass lens warps and magnifies the objects beneath it, namely, the ancient scroll on the desk.

Main geometry from scratch:

I modeled all of the main geometry in my image, including the Clemintum globe, the magnifying glass, the stacks of books, the manuscript and star map, and the lattice window. The only things I imported were the desk, the bookshelves in the background, and some of the books filling the background bookshelves.

UV mapping and texturing from scratch:

I individually UV unwrapped all of the books in the book stacks on the desk, and applied textures through image nodes. I also applied textures to the Clementinum globe (both the globe itself and the glass half dome) utilizing the shader nodes. I also used the glass shader node to texture the lens of the magnifying glass.

Blender/Cycles advanced feature:

I utilized volumetric rendering to create the god rays, to show light streaming from the window onto the desk. I also used depth of field, to focus on the desk, and the Clementinum globe specifically, resulting in a slight blur for the background objects.

Work balance:

I worked alone, so I did every part of the project.

Citations:

Tutorials:

- Clementinum globe (modelled freehand, but textured with tutorial <https://www.youtube.com/watch?v=ND1CwDWMles&t=150s>)
- Magnifying glass (<https://www.youtube.com/watch?v=zcVFB2NjfpE>)
- Books (<https://www.youtube.com/watch?v=lZaIkmRK5Gc&t=602s>)
- Manuscript and starmap (https://www.youtube.com/shorts/r13_MdumvtE)
- Window (combination of <https://www.youtube.com/watch?v=MqFvmFIN6pk> and <https://www.youtube.com/shorts/RAj8Bqur35Q>)
- God rays (combination of https://www.youtube.com/watch?v=8U-TVkdH_Ps&t=47s and <https://www.youtube.com/watch?v=HjBOiSqrejY>)

Imported assets:

- Desk (<https://www.cgtrader.com/free-3d-models/furniture/table/walnut-pedestal-desk>)
- Background bookshelves (<https://www.turbosquid.com/3d-models/dusty-old-bookshelf-1900971>)
- Background books
 - Red Rock
(https://www.blenderkit.com/asset-gallery-detail/76306710-3b4a-49c2-b00d-5aa27be363f2/?query=old+books+order:_score+availability:free)
 - Leather-bound book
(<https://www.blenderkit.com/asset-gallery-detail/ab5c93ef-2772-49bf-86af-0b46e4b23544/>)
 - Holy Bible
(https://www.blenderkit.com/asset-gallery-detail/0aeb3375-19ce-4187-9f6d-545b04c5d64d/?query=category_subtree:literature+bible+order:_score)
 - Medieval book
(<https://www.cgtrader.com/free-3d-models/Various/Various-Models/old-book-medieval-lowpoly>)
 - Another old book
(<https://www.cgtrader.com/free-3d-models/household/other/a-simple-book>)

Images used for texturing + background:

To texture my various objects, I used a combination of images found on Google Search, Pinterest, as well as some images used by online Blender book models (I screenshotted the book covers used and UV unwrapped the screenshots onto my own book models).

- Prague skyline used for HDRI background
(https://commons.wikimedia.org/wiki/File:Prague_Skyline.jpg)

- Beowulf manuscript used for manuscript on table
(https://en.wikipedia.org/wiki/Beowulf#/media/File:Beowulf_Cotton_MS_Vitellius_A_XV_f_132r.jpg)
- Vintage star chart used for manuscript on table
(<https://fineartamerica.com/featured/antique-constellation-map-southern-hemisphere-by-john-flamsteed-1729-blue-monocle.html>)
- Basic book cover designs pt 1 (<https://www.pinterest.com/pin/25543922886286320/>)
- Basic book cover designs pt 2 (<https://www.pinterest.com/pin/114490015524604296/>)
- Intricate book cover (<https://www.pinterest.com/pin/296745062956932554/>)
- Grimoire book cover (<https://www.pinterest.com/pin/206602701651647709/>)
- Tattered book cover (<https://www.pinterest.com/pin/211174974433941/>)
- Book cover image from David Balfour book
(https://www.blenderkit.com/asset-gallery-detail/434a48ca-9abe-4035-a80d-41ceff4816a1/?query=old+book+order:_score)
- Book cover image from Scientist Journey book
(https://www.blenderkit.com/asset-gallery-detail/fff2f538-af1e-4ce1-972e-6504d4f922b7/?query=old+book+order:_score)
- Book cover image from The Cavalier
(https://www.blenderkit.com/asset-gallery-detail/9bf54df0-c53a-4fa1-8ed4-854ed2183164/?query=old+book+order:_score)
- Book cover image from occult book, displacement texture image also used
(https://www.blenderkit.com/asset-gallery-detail/b9298a8d-5bae-45df-8e5b-6375ab906199/?query=old+book+order:_score)
- Book cover image from War and Peace book
(https://www.blenderkit.com/asset-gallery-detail/9422b025-9a30-44c4-9908-2696da5882ec/?query=war+and%20peace+order:_score)
- Leather texturing images for top book (<https://ambientcg.com/view?id=Leather037>)