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CS 148 Final Project

Avatar's House: I created 4 isometric rooms to embody the four elements from Avatar the Last Airbender: earth, water, fire, and air. The scene incorporates the consistent stained and transparent glass textures throughout all rooms to promote a sense of harmony between the elements. The rooms are placed quadrant layout and the camera angle is not biased towards any one room: these design decisions are intended to invoke a sense of balance and calmness. After all, it's the Avatar's ability to achieve a powerful balance between the four elements which makes them so special!

Meeting the Project Requirements

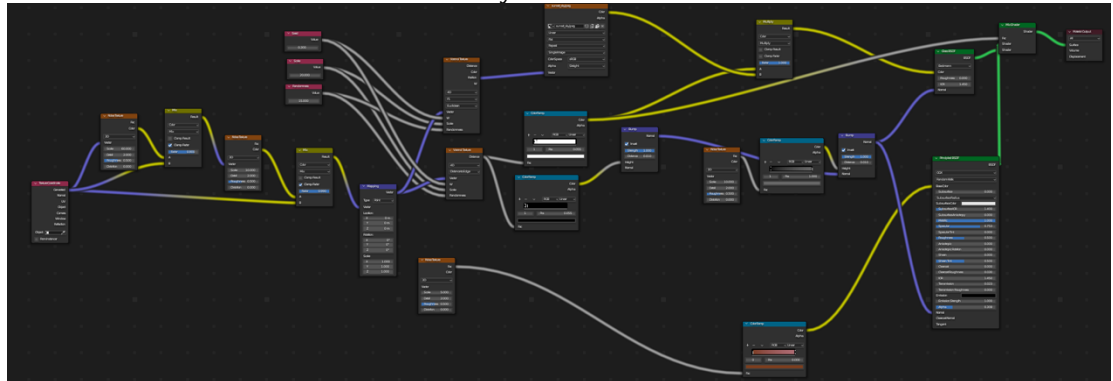
- **Leverage the Power of Raytracing:** The scene has an abundance of glass (stained glass, normal glass) with different thicknesses, IORs, and colors. These glass objects give rise to reflections, refraction, and transmissions. Further, the scene includes a swimming pool in the water room (plane with an ocean modifier), which refracts light and distorts the angles of the glass pillars. The pool has caustics enabled, leading to bright patterns where light converges. There are shadows throughout the scene, and they are especially visible in the pool.
- **Main geometry from scratch:** I modelled the majority of the scene's geometry from scratch, excluding 3 small objects (the potted plants and mushroom in the Earth loft). The objects I modelled from scratch include:
 - Banners: plane with Bezier curve
 - Walls, floors, windows, panels: beveled planes, used Boolean modifier or knife project tool to cut holes
 - Décor including hanging crystal fixtures, water fountain, fire pit, glass tree and pointy crystal, all furniture: basic geometry, extrusions, beveling
 - Trees (real and glass): used skin modifier and extrusion to create branches, particle system for leaves.
 - Grass: particle system
 - Pillars: cylinders
 - Water in water fountain and pool: used water simulation for the fountain, and ocean modifier on a plane for the pool

I also created the materials for majority of objects from scratch—this includes everything except for the two potted plants.

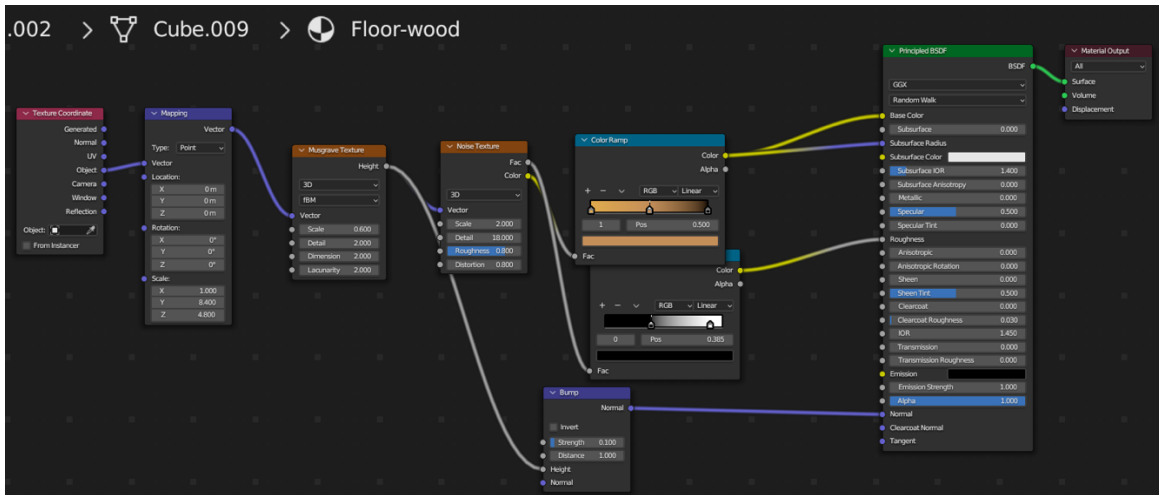
- **UV Mapping from Scratch:** I downloaded an image of the four elements from Avatar from online to use as the base color for the banners ([linked here](#)). I created the banner geometry using a plane with a Bezier curve, and UV-mapped the planes onto different regions of the texture such that each banner shows two elements. See the banners below!



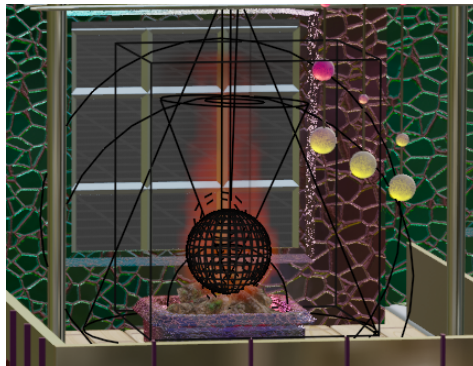
- **Texturing From Scratch:** I created most textures procedurally: this includes the texture of stained glass, crystal orbs and rock, fountain, marbled furniture in the air loft, leaves, tree bark, wood, transparent and opaque glass panels, grass.
 - For instance, the stained glass required several noise textures, color ramps, and Voronoi nodes to generate the “tiles” in the stained glass, where each tile is surrounded by a metallic border.



- Another example, wood: Uses Musgrave texture, noise texture, and color ramp to generate wood-like patterns on the floor in the fire room and air loft.



- **Blender/Cycles advanced feature:** I used volumetrics to simulate fire and smoke in the fire room.



- **What each member of the group did:**
 - No partners, just me! 😊
- **What assets you downloaded from online vs. what assets you made yourself**
 - **Downloaded:**
 - I downloaded an [image of the four elements](#) (Avatar-style) to use for the UV-mapped banners.
 - I used a cloth normal map and displacement map for the banners from and color/normal/displacement maps for the rocky table in the earth loft from [Texture Haven](#)
 - The stained glass pattern displays colors from an image I found online after searching “bright fire watercolor”
 - I downloaded an HDRI background from [HDRI Haven](#).
 - **Made myself:**
 - I made the vast majority of geometry décor and architecture in the scene (walls, floors, pillars, banners with curled ends, mirrors, water fountain, fire pit, trees, furniture, crystals, swimming pool) in the scene from scratch. I also created several simulations (water fountain, fire) and particle effects (grass) from scratch. Further, I created the majority of textures procedurally.

- ***Citing Sources:*** Here are some key tutorials I followed!
 - [Procedural stained glass](#)
 - [Procedural stained crystal](#)
 - [Swimming pool with caustics](#)
 - Followed general idea of this [fountain tutorial](#)