Senior Project Living Document
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August 23, 2017

I was asked to list out the career areas that I personally find to be the most interesting.

The five areas that appeal to me the most are as follows:
Environment Design
Lighting
Visual Effects
Texturing
Story
Coding

I was asked to do some research of different companies with new and innovative ideas.

One company I found is broadening the horizons of the Virtual Reality, or VR, world. Rewind is a VR company based out of London, England.
http://rewind.co/

Over the last year, they have created a VR Opera experience, in which those who put on the headset can see, hear, and interact with the very opera itself!
The project is called Madam Butterfly - a project created entirely inside Unity and exported for Google's VR headset, Daydream.
https://vr.google.com/daydream/

The project also incorporates Houdini for the VFX, and a program called CAMERA for the body and face motions. It should also be noted that REWIND is considered the first company to use Houdini for Google Daydream. Below is a trailer for the project
https://youtu.be/cBW8KVRhZEs

In a recent article by TechNewsWorld.com, I learned about a company called Merge. This company's goal is to do just what their name suggests - merge VR and AR together into one product. Based on what I read, their headset allows you to view hundreds of vr apps whilst the headset remains dark enough around the edges so you can remain immersed in the VR experience. If you choose to run an AR app, you can remove the dark sleeve the headset comes with, which will allow your smartphone's camera to work with the AR app. So in a nutshell, they have created a headset which can do both VR and AR easily without having to switch between devices or headsets.
https://mergevr.com/about
https://mergevr.com/miniverse
http://www.technewsworld.com/story/84744.html

I came up with project ideas that would fit into my career goals (as were mentioned above).

FIRST IDEA
One idea I had was to make a haunted house level.
It would have old and rundown props, the house itself would be made to look like it had been abandoned for years, and everything would be covered in dust. As for the lighting, I'd have it be a night but there would be lit candles spread throughout in the level. Ghostly Will-o-wisps would float around darker areas and would emit a ghostly light. I was even thinking of have either a face or just some creepy eyes watch and follow the player from a distance. Or maybe the lights could all go out for a moment and illuminate the face or eyes.
So as a rundown of my above listed goals:

Environment Design
- an old and abandoned house with aged and decayed props

Lighting
- candles and ghostly lights. Maybe have the moon shine through the windows.

Visual Effects
- The Will-o-Wisps, dust particles floating in the air, tricks of the light and shadows

Texturing
- The walls have faded, and peeling wallpaper
- The furniture would be dusty and maybe stained
- The floors would be wooden and aged
- Any portraits would be faded and warped
- The creepy eyes would have to "pierce your soul"

Story
- Have the props and scenery tell the story of a house the fell into despair. Examples could be a Final Notices lying on the floor, an empty pill bottle, a noose, etc.

Coding
- Have events take place within the house when the player does certain things or moves to a specific point.
  - Perhaps have an audio cue for creepy sounds
  - Perhaps trigger a jumpscare

Here is a link to a VR Horror Game that I pulled inspiration from: https://youtu.be/TwRhniBoe5s

SECOND IDEA
Make a Fantasy-themed garden or forest. There would be a massive treehouse in the middle of it where fairies and pixies live. Glowing lights would illuminate the interior and shine out into the surrounding area. Fireflies and perhaps some mist could also hover and dance around.

Environment Design
- Trees
- Foliage
- A Pond
- One uniquely shaped giant treehouse

Lighting
- Fireflies would give off light
- The Sun shining through the leaves
- Reflections on the pond
- Glowing light from inside the giant treehouse

Visual Effects
- Wind
- Smoke coming out of the top of the treehouse
- Glittering fairy dust

Texturing
- The trees
- The ground, showing detail in the earth
- The treehouse (make it look ancient but healthy at the same time)

Story
- Perhaps have a sign which tells of how the Fairy King and his people fought a great war in this environment and this is where they rose victorious of their enemies.

Coding
- Have pedestals around the area which, when activated in the right order, open a door to the Treehouse

Video I am using for Reference
Ori and the Blind Forest
https://youtu.be/n0jIUSAik2k

Trine - Fangle Forest
https://youtu.be/Ylrlf43i1eE

THIRD IDEA
An ancient underwater temple. The player could traverse the inside of the temple but if they go outside they can swim around.

Environment Design
- Ancient, holy edifices
- Pillars
- Sandy ocean floor
- Statues

Lighting
- Soft light from the sun up above
- Glowing stones which give off soft light
https://creative.pluralsight.com/tutorial/1900-Creating-Cinematic-Underwater-Lighting-in-Maya

Visual Effects
- Bubbles
- Specks and dirt that would float around the camera
- Breathing effect

Texturing
- Aged stone for the temple and stautes
- Gritty sand for the floor
- Rusted metal perhaps

Story
- The concept alone would tell of an ancient race long gone

Coding
- What would be cool is to find a way to form a bubble of air around you so that you can walk on the ground instead of swimming

Links to videos that I'm using as reference

Legend of Zelda: Ocarina of Time (Water Temple)
https://youtu.be/x6lO1Ks7lsw?list=PLEl5CB3gzprx4FynmqZ-z0mdmkXULHl1M

Subnautica
https://youtu.be/jRTP6KHRq2k

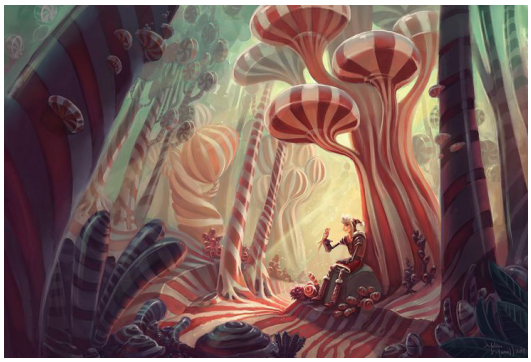
Narcosis Playthrough
https://youtu.be/lhLfNhUXKYY

FOURTH IDEA

A Realistic Candyland. Combine the kid-friendly world of a candy land with realism. So basically, think of a typical game with realistic looking forests like Skyrim, but instead of snow and ice, it's candy.

Environment Design
- Giant Lollipop trees
- A Frosted Gingerbread castle
- A bouncy, gummy river
- A Chocolate Mountain
- A sign which reads "Beware! This way to Healthy Hollow." and have it point somewhere off the map.

Lighting
- Bright sunlight
- The Lollipop trees would provide shade as you walk by them
- Torches by the Gingerbread castle



Visual Effects
- Sugar would act like falling snow
- Wind blowing on the torches and sugar snow
- Cocoa dust would act like a dust devil
- Glittering sparkles off the gumdrops on the castle

Texturing
- A glossy texture for the lollipop tops
- A grainy wooden look for the sticks
- A gummy bear texture for the river
- Gritty and/or whipped look for chocolate

Story
- A sign the character can click on which will tell of the Candy citizens fight against the "Healthy Heathens"

Coding
- You can interact with the signs
- You can equip a Chocolate Sword and a Gummy shield.

August 24th 2017

I have changed my mind about Candyland. I'm going to be working on the Underwater Temple instead. The scope I had in mind for the Candyland was too big for a two semester project. I had wanted to include a chocolate sword that the player could equip, along with a gummy shield. The only problem with that is I would then need to have included a reason for the sword and the shield, which meant that there would have to be enemies. Enemies mean they would have to be modeled and textured to look like they belonged in the Candyland world. They would also have to be rigged, animated, and have enemy A.I. scripts.

This is why I decided to switch to the Underwater Temple.
I re-did my Google sheet to include all the assets for the Temple.
The idea is that you play as a deep sea diver who has uncovered an ancient temple buried beneath the waves.
The player will have a diving suit overlay, such as the one pictured here:

The above example is from the indie horror game, Narcosis. The player in that game had to keep track of their oxygen level.
The same will be true in my game. The player will have to keep track of their oxygen as they explore the underwater temple. If the oxygen gets too low, the player can approach the statue located in the back of the temple, and recieve a blessing which will restore their O2 tank.

August 25th 2017

I presented the refinement of my Water Temple idea, along with the updated Google Spreadsheet.
A couple of adjustments to the spreadsheet will have to be made but other than that, I was tasked with coming up with a one page pitcher for my level. I also need to come up with a name for my project.

August 27th 2017

I set to work creating a One Page Pitch of my game level. At the same time, I have decided to call my project, Salvation Under the Sea.
Below is the pitch which I shall present to my class tomorrow.

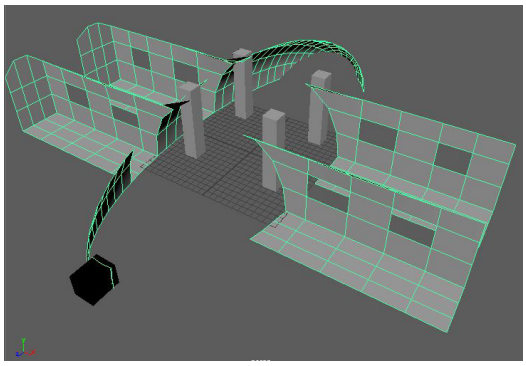
Salvation Under the Sea

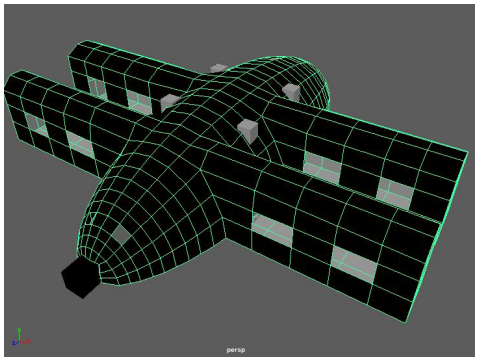
"But God hath revealed them unto us by his Spirit:
for the Spirit searcheth all things, yea, the deep things of God."
1 Corinthians 2:10

Mankind has existed for thousands of years and in all that time, we have explored less than five percent of Earth's oceans.
As a deep sea diver whose approximately 1600 feet underwater, you should be dead. But you're not. Why? Perhaps the answer lies within the hallowed halls buried beneath the waves.

September 4th 2017

I modeled a very rough concept of my water temple in Maya.
Here are two images showing off the skeletal structure of the temple. The images represent the temple with and without backface culling.

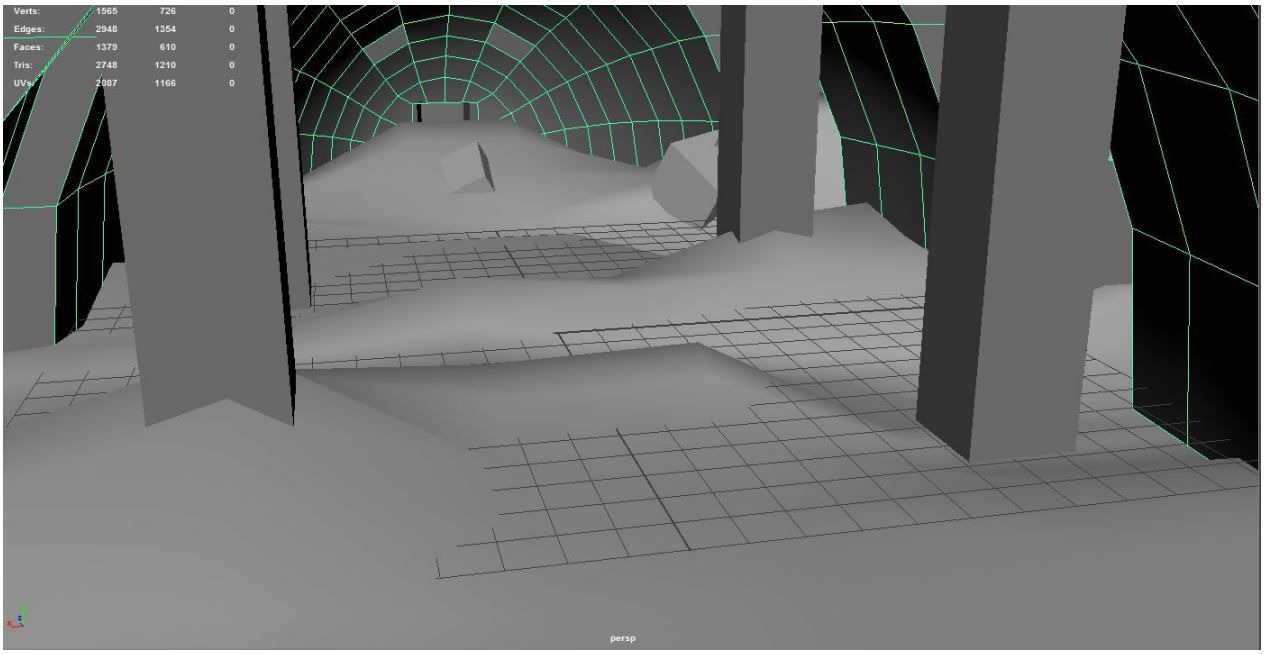




I will retain the scale as is and begin modeling out more assets and do a second pass on the temple model itself. Then I will make a video in Unity which shows off my progress.

September 18th 2017

I did a first pass on the Whitebox. The floor was still too flat, so I decided to go in and give the ocean floor hills and peaks. I also went in and added rock and coral placeholders.



September 20th 2017

The hills and peaks of the ocean floor were far too extreme and needed to be smoother.
Also, I want to go in and make the temple look more decrepit and ancient.
I want to go in and add caustics to a light that will be coming down on the temple and I want the character to be able to swim.

September 22nd 2017

First pass at the Whitebox was due. Couldn't figure out the caustics or the swimming mechanic.
Below is a video of the first pass, regardless.
https://www.youtube.com/watch?v=twBD7bZDsoE&t=2s

September 24th 2017

Continued to try and figure out how to animate caustics and implement a swimming system.

September 25th 2017

Spoke with my professor about caustics. Keep focusing solely on caustics but did not get far. Studied more about caustics. It's really looking like I'm going to need to study how to create a shader then apply the shader to a projector in Unity and get the caustics to work that way.

September 26th 2017

Researched shaders and how they work, how they are built, and how they can be animated. These are links I have been using:

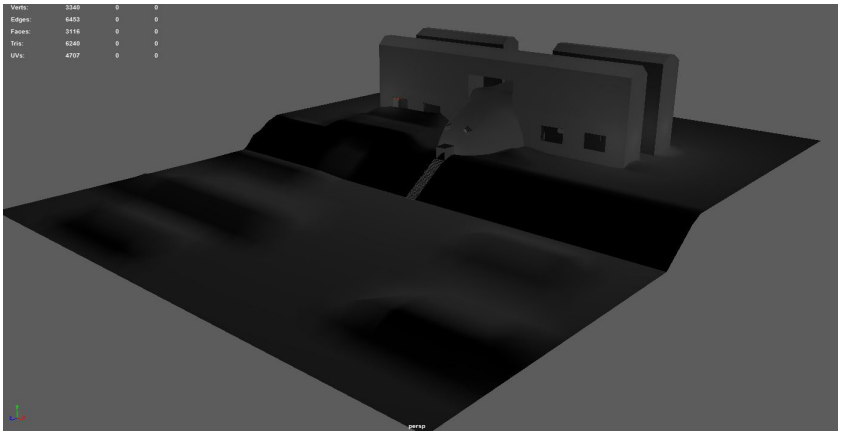
https://docs.unity3d.com/Manual/SL-SurfaceShaderExamples.html
https://docs.unity3d.com/Manual/SL-SurfaceShaderLightingExamples.html
https://docs.unity3d.com/Manual/SL-SurfaceShaders.html
https://docs.unity3d.com/Manual/ShadersOverview.html

September 27th 2017

Professor was able to help me solve the swimming mechanic issue.
I went into the FirstPerson Controller and changed the code so that when you press space, you swim higher and higher. If you stop pressing the space bar, the player descends. Also, the temple still seems very plain and basic. I'm going to see if I can add on to it.

September 28th 2017

Added geometry to the temple so that it had a second floor and longer hallways. Added stairs going to the upper levels, added more windows, and added a spire with windows so the Trident could receive more light.



September 29th 2017

Refined Whitebox due. Added white box textures.
Below is a video demonstrating the changes in Unity.
https://youtu.be/kFJ1NM_j1jI

October 2nd 2017

Removed one of the hallways. I am implementing arches to make makeshift hallways down the center.
Began trying to figure out how to:
First, make it so the player can turn the flashlight on and off (got that working).
Second, display a message showing how much battery your flashlight has left before it reaches 0 (still trying to figure that part out).
Third, once the battery drains completely, a message is displayed telling you your battery has drained and the flashlight stops working.
As a stretch goal, it'd be nice to have the player have someway to restore power to their flashlight.

October 4th 2017

Went in and remodeled the Temple. Removed two of the hallways so there was only 2 instead of 4. Made it look much more church like. Added a hole at the top where the character will be able to enter in through.
Went back and researched basic lighting. Added a light cookie to the window behind the trident and applied emission to the window.
Added the sand terrain and the coral.
Here is a video of the temple BEFORE the sand and coral were added:
https://www.youtube.com/watch?v=mLWEdRNwX_Q

October 6th 2017

Realized that I may have been overthinking caustics.
Watched some videos about how to animate UVs.
Tried a new script and got the UV animation to work, but the caustic graphics are still not flowing through the animation properly. It's very choppy and jump around too much. Will try and smooth it out.

October 7th 2017

Latest Model with latest lighting and caustics progress.
https://youtu.be/lrDQyzUDrlw

October 11th 2017

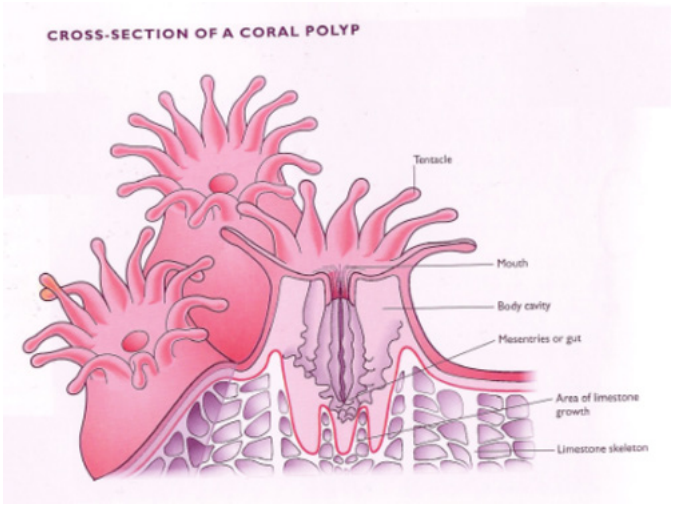
There is a cathedral in England called the Lichfield Cathedral, which has a very beautiful interior and design. I will include pictures of it, as I have decided to remodel my temple to be based off of this cathedral.

October 12th 2017

With my professor's help, I got the Window frame I wanted figured out.
Straightened and fixed a lot of the geometry so the edges matched up nicer.

October 13th 2017

Began modeling out the coral and refining it based on reference.
Continued modeling the temple and started to look for hidden extra edges, faces, and verts.



October 15th 2017

Apparently there were a lot of hidden faces, edges, and verts. I cut the model in half and began cleaning up what was hidden.
It will not be hard to get everything back into place once that is done.

October 16th 2017

My Underwater Temple with the stones, coral polyps, prayer shrines, and the trident.
Also added the hole on top where the player will enter through.
BEFORE ASSETS: https://skfb.ly/69zrS
AFTER ASSETS: https://skfb.ly/69zAB

October 17th 2017

Environment model is currently still only at prototyping stage.
I need to study the Lichfield Cathedral and model one section of the walls after it.
I CANNOT skimp on the detail of the arches! I'm not going to worry about any other assets at the moment.

October 18th 2017

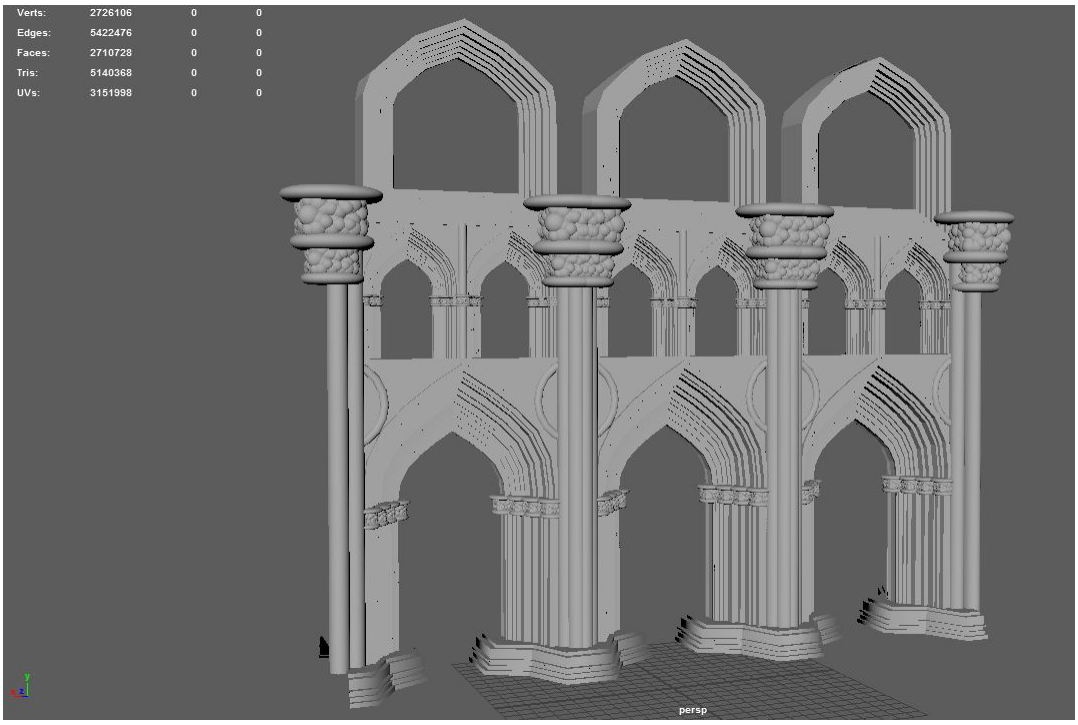
Began to properly model and refine the window model.

October 20th 2017

Continued modeling and refining the arches and the windows after the Litchfield Cathedral reference.

October 21st 2017

Further cathedral wall refinement. I am very happy with the way it is shaping up.



October 23rd 2017

Reached a point where all I had to do was copy the wall frame over and paste to make the hallway, but every time I tried to extend the hallway, Maya would crash.
Despite my clearing the history and saving often, work was still lost.
For my new user story, I need to finish the Underwater Temple Altar and prepare the Temple mesh for UV mapping. Once again, using the Litchfield Cathedral as reference.

October 30th 2017

Took a break from my temple to focus more on learning Houdini so that I can procedurally generate assets that can be pulled into my scene in Unity.
Completed the Temple Altar. However, I can no longer open my temple file in Maya. It will just sit there for days and spin and spin and spin. I assume it is because the polycount was hovering around 5 million (a 2.8 GB file).
I will get the large file size issue figured out in class so that I can attach the altar to the rest of the temple and everything will be ready for UV'ing.
https://skfb.ly/69RP8

October 31st, 2017

I discovered the large file problem, and I learned why the polycount was so high.
Back when I modeled out my temple wall, the spire decorations alone added a few thousand to the polycount. But the real problem came when, apparently, I duplicated the whole wall (decorations included) and kept it underneath the original. So, in essence, when I duplicated out the walls and mirrored them to form the temple, I basically had 2 copies sitting on one another. Hence, the extremely large file size/polycount, and the inability to open the maya file.
What I am doing now, is I am going in and cleaning up the original temple wall panel, deleting the spheres, making sure nothing has been duplicated upon itself, and then use instancing instead of duplicating.

November 1st, 2017

Cleaned up the original temple wall panel, instanced out to make the temple, then I threw on the altar. Below is a video of my work thus far.
https://www.youtube.com/watch?v=3YY8zipfmUY