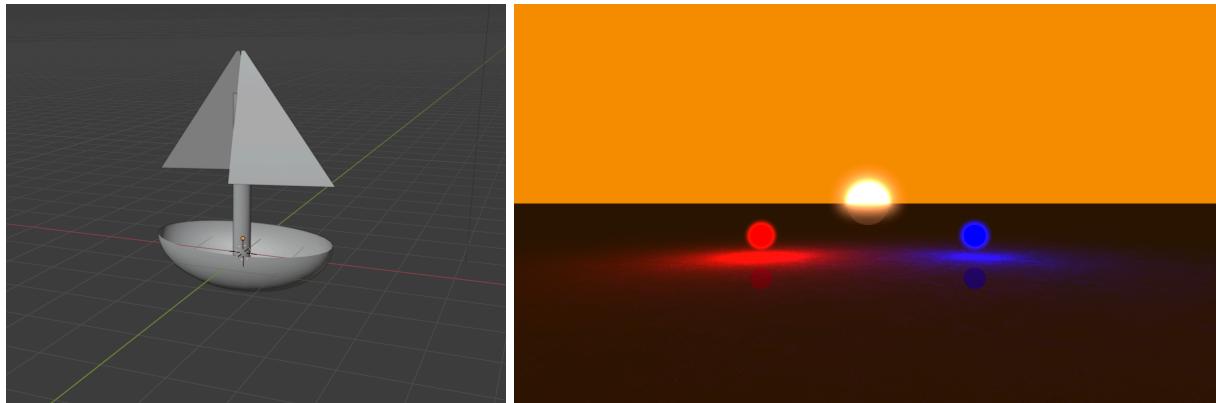


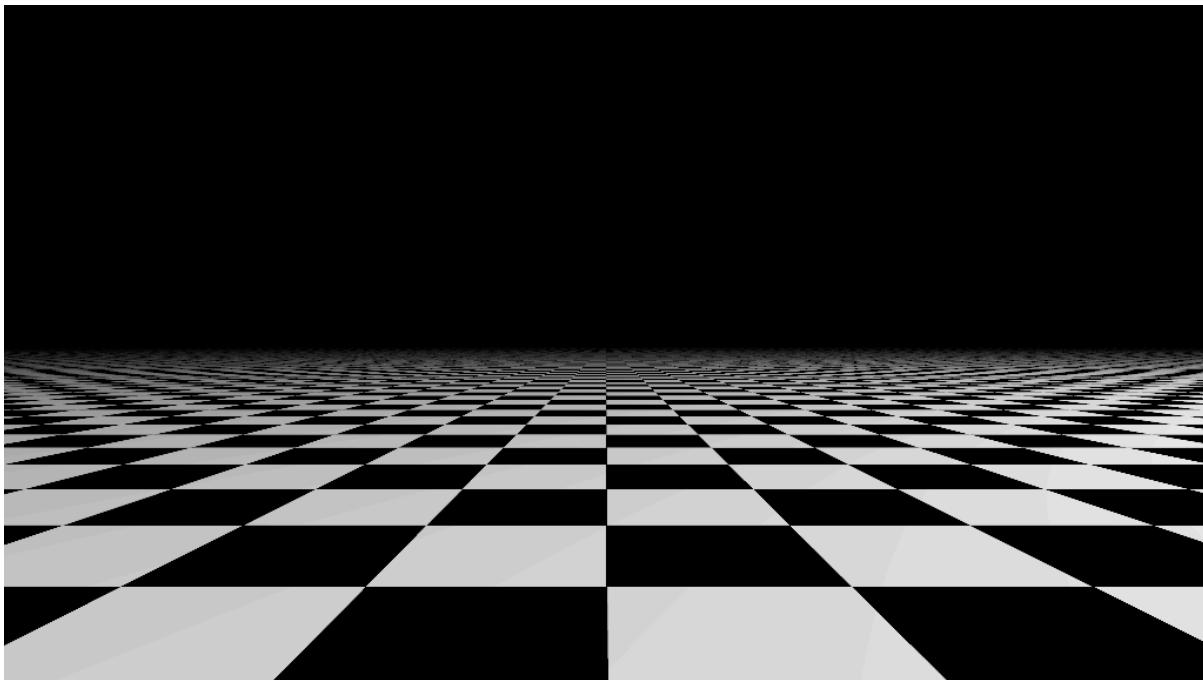
CS 4620: C2 - Nicholas Andersen and Mika Finkman

There are several technical features implemented in our code that we played around with, even if they were not all included in our final image. They are all listed below:

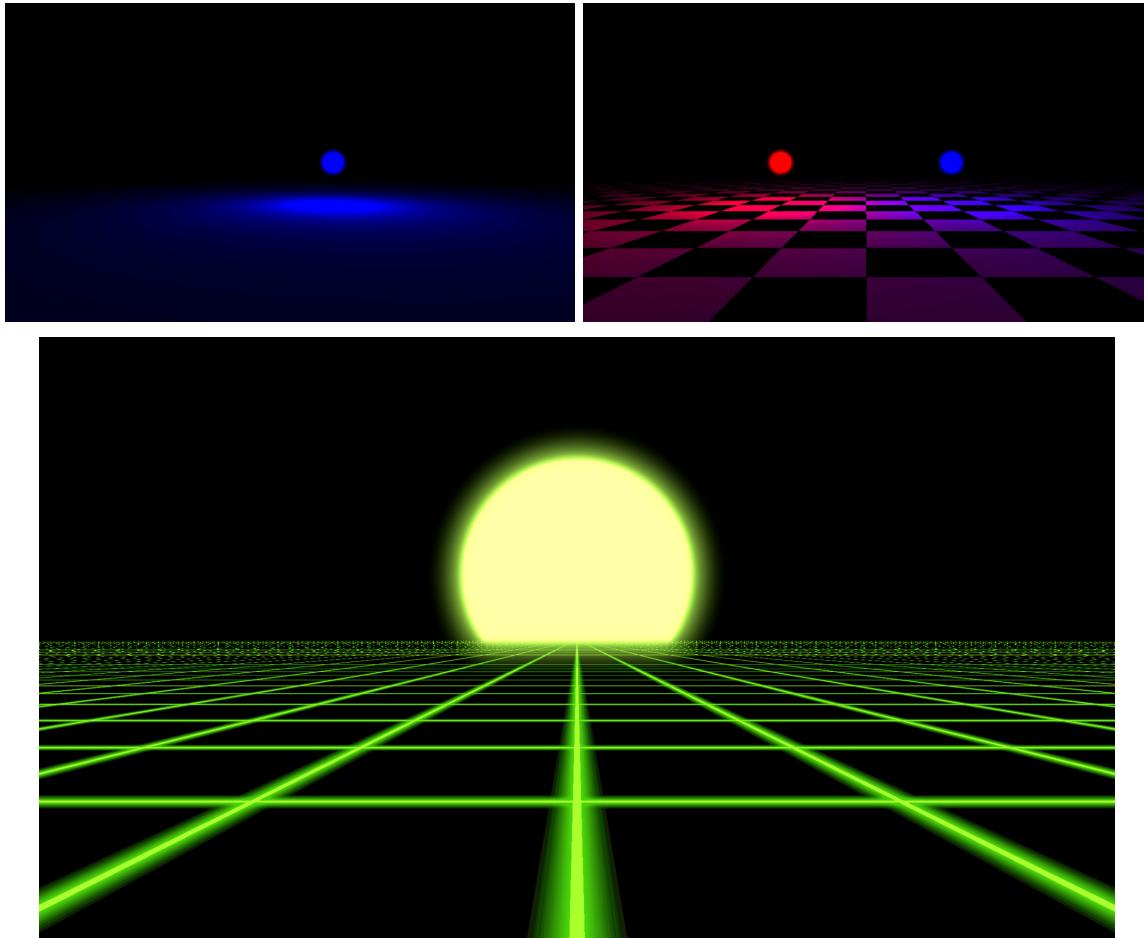
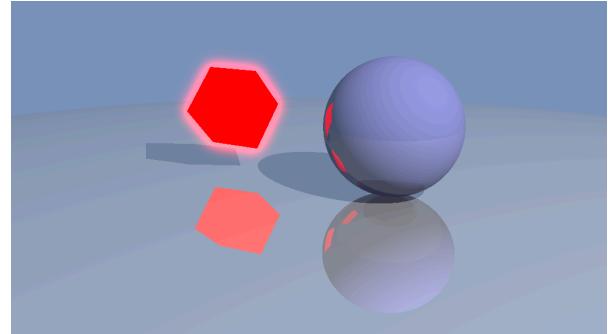
Custom 3D boat model and infinite plane primitive. We set on a custom boat model as it is the centerpiece to our final image and gives a sense of life and humanity to the scene that is otherwise barren. We also created an infinite plane primitive as it is low-cost performance wise and adds the most value to the scene.



Anti-aliasing using supersampling. Here we used two different supersampling algorithms. First we looked at the standard grid algorithm and implemented it. Then under further investigation we found the rotated grid algorithm that provides better anti-aliasing for edge cases. This is the result:



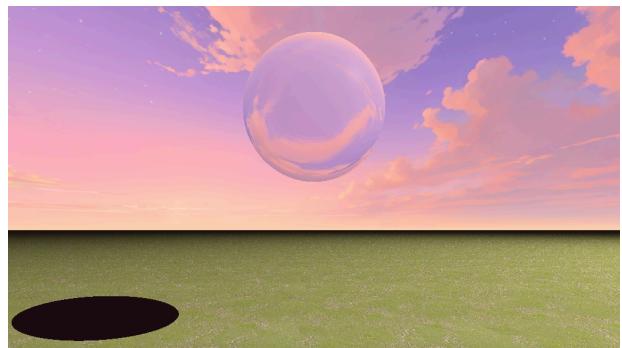
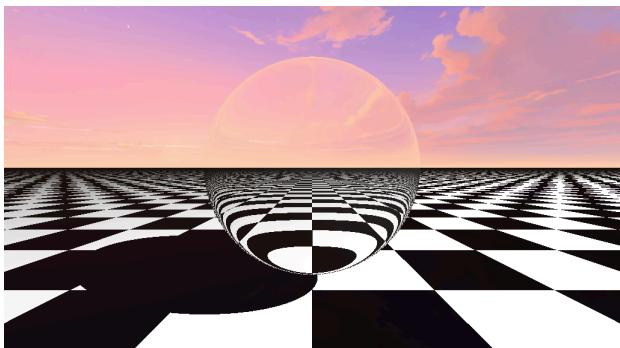
Material Emissivity and Post-processing bloom. This is one of the main focuses of our initial scene idea. We wanted to go for something more cyberpunk/tron-like and as such wanted glowing neon lights everywhere with a dark scene. We ended up pivoting and then used the emissivity to represent the sun in our sunset scene. We made sure that the emissive objects emitted light of the color that they were and added the glow effect in post-processing using gaussian blur. We created 2 masks, 1 for the emissive material glow effect, and then 1 for bloom for bright objects in the scene (using luminance formula for human perceived brightness).



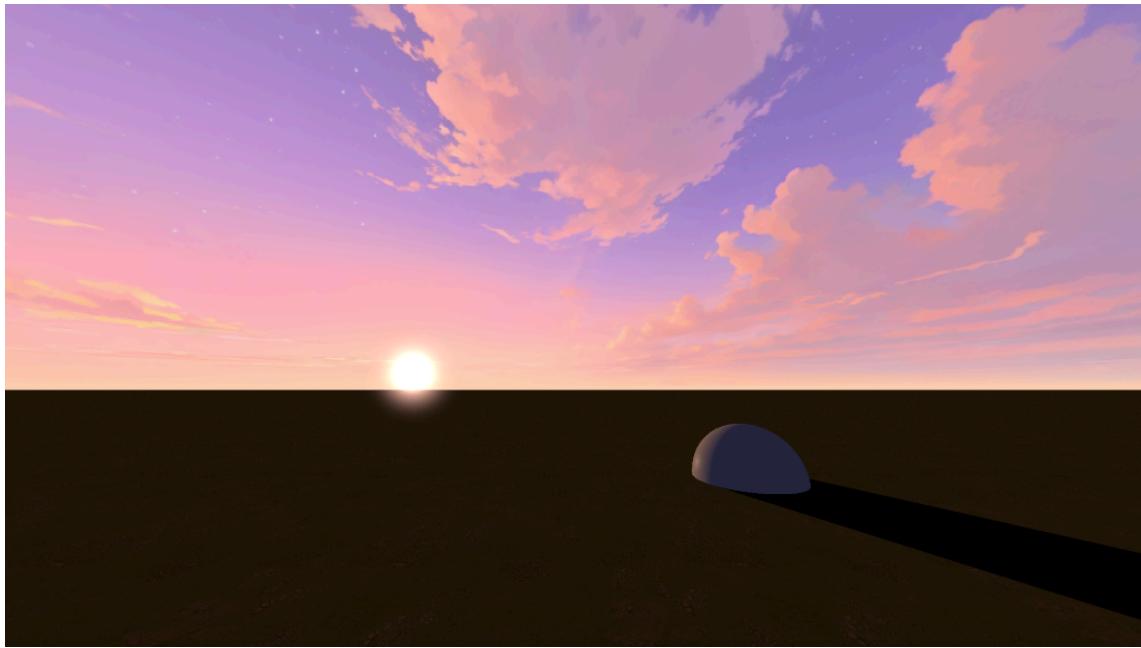
Texture Mapping. We implemented texture mapping both on spheres and the infinite plane. This can be seen below through the mapping of an Earth texture onto a sphere and the mapping of a water-like texture onto a plane.



Refraction. Next we added refraction, the purpose of this was initially to make the water look nicer (by having a ‘volume’ as the water and a plane as the ocean floor), however we ran out of time. We then thought about doing something like the image to the right, however opted not to in the end as we felt we needed a couple more features (such as fresnel reflection) and higher poly assets to make it look nice. Below are some images of our refraction. *Note, that in these images the refractive index of the glass sphere is way lower (1.125) than in reality (1.5) and that's why we don't see as much refraction as we would in a normal glass sphere.*



Skybox using cube mapping. Finally to make the scene complete, we needed a beautiful sky. This rounds out the image and really makes it feel real. We decided on a stylized skybox to match the stylized water and sand texture, and to match the low poly boat.



Resources:

Earth Texture - <https://www.solarsystemscope.com/textures/>

Skybox Textures - <https://freestylized.com/all-skybox/>

Sand Texture - <https://3dtextures.me/tag/sand/>