Homework 4 Problem 1

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ComSci 557

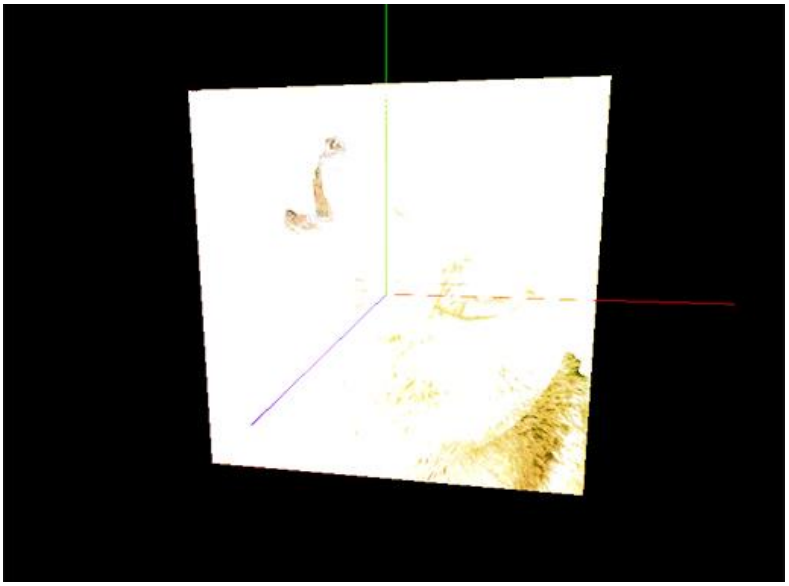
The three images used in Problem 1 are shown below.

Three functions were tested for blending of the images, and are given below. Tex_color represents the deathstar texture, tex_color_light represents the wolf, and tex_color_new represents the gradient.

Blend Function 1:

```
color = 0.1 * pass_Color + tex_color + tex_color_light + tex_color_new;
```

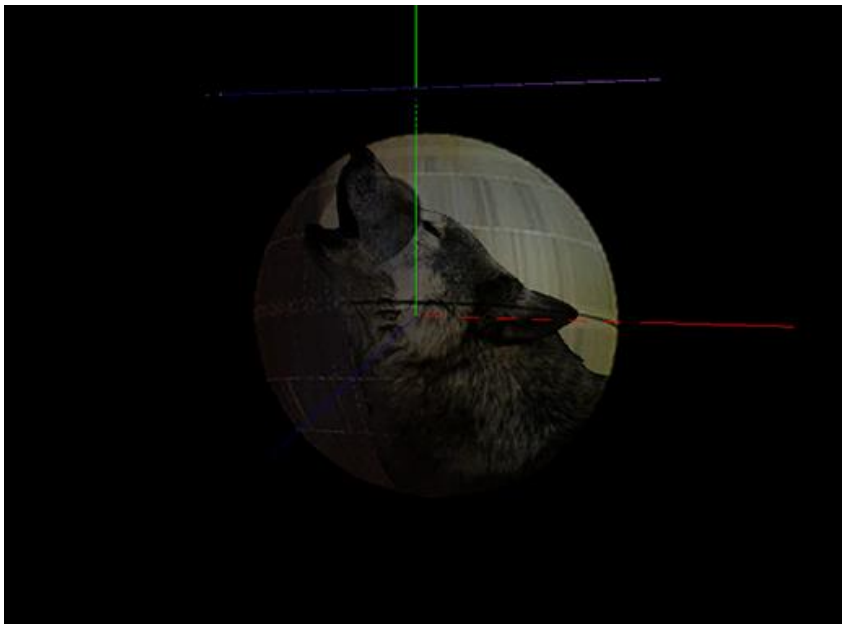
This function was provided by Dr. Radkowski, and simply uses a pass color while adding the color values for each image. It creates the following composite image, which obscures and over-exposes the textures.



Blend Function 2:

color = tex_color * tex_color_light * tex_color_new;

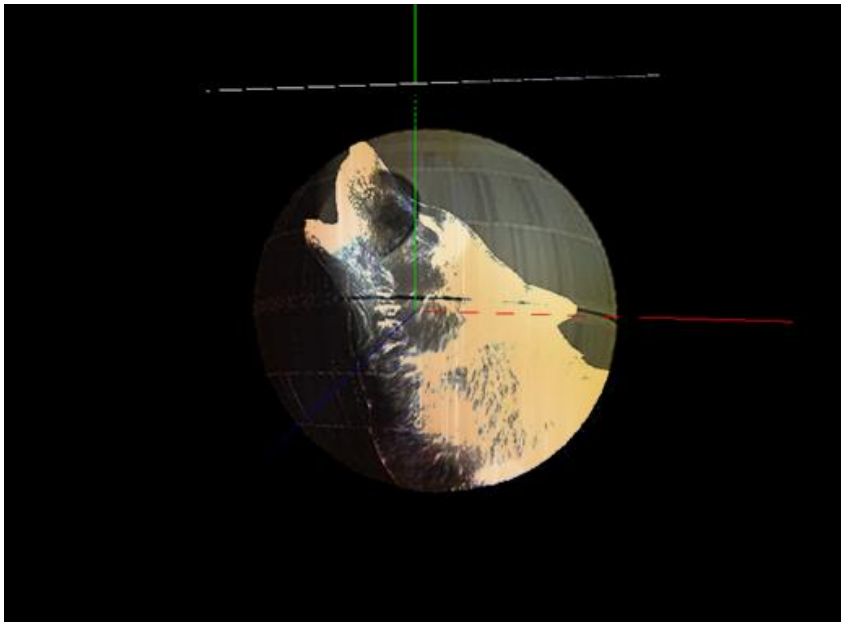
This function was also provided by Dr. Radkowski, and utilizes simple multiplication of pixel color values for each image. The result nicely shows the overlay of each image, but the gradient is somewhat obscured. For this reason, a third blend function was tested.



Blend Function 3:

color = tex_color / tex_color_light * tex_color_new;

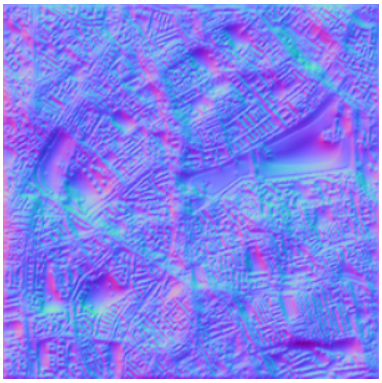
Because the wolf overlaid onto the moon created such a dark image when multiplying, we decided to divide the two instead. This effectively inversed the image (since they were likewise color topologies) and created a light on dark contrast. The gradient was then multiplied to create a color scheme of gradient on light and gradient on dark.



Homework 4 Problem 2 Report

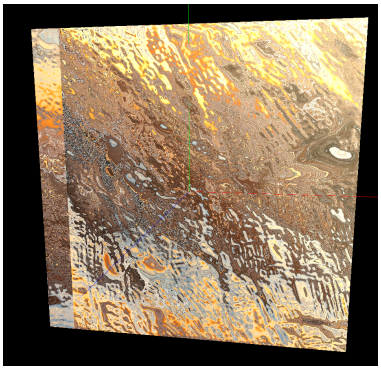
Our scene uses an image of New York City skyscrapers at dusk. Our intention was to give it some specular light to emphasis the sunset and then to distort it with a unique noise map. The noise map I ended up making is a 'grid' of a city taken from a satellite. The noise map emphasizes small details of roads and buildings, and the intention was have these details distinguishable in the distorted scene.

Landscape (Color map)

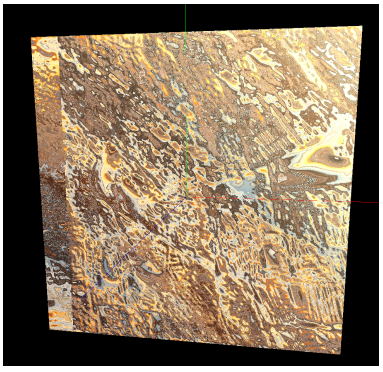


Noise map

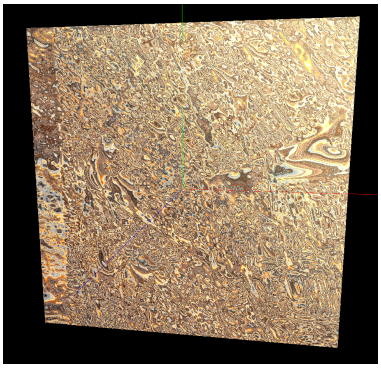
We first observe results of some extreme displacement functions. When calculating a large noise vector by not scaling down the normalized value, or even by scaling it up, the details of the noise map are more visible in the scene. As shown in the figures below, you can make out the blocks of street as well as smooth parts of the noise map. At 5 times, the noise becomes too dense.



1× Normalized Noise Vector

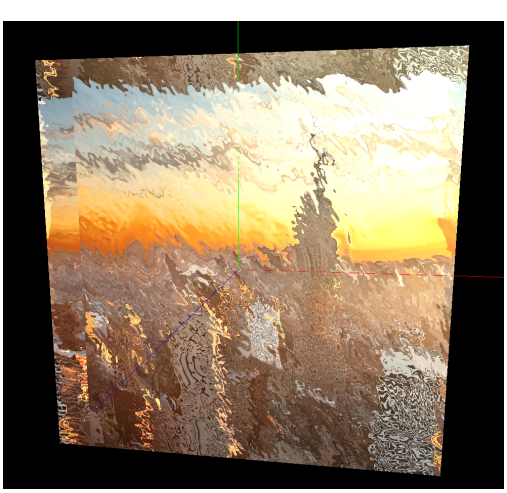


2× Normalized Noise Vector

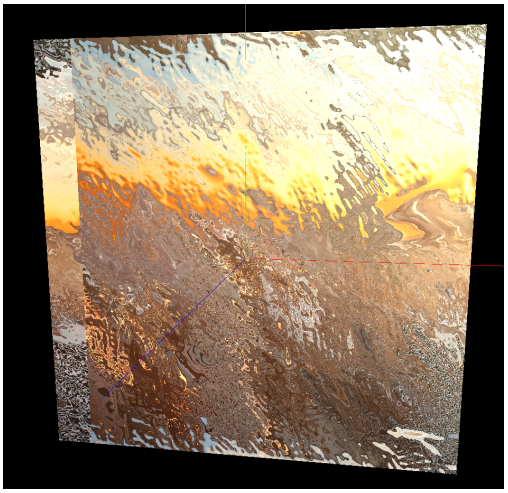


5× Normalized Noise Vector

Regardless, the result is undesirable because you can hardly see much of the landscape. The goal is to have the landscape still distinguishable, but with minimal displacement so you can just make out the noise map. Below are some results after scaling back the noise vector in different ways.



Less noise
$(\text{noiseVec} * 3.0 - 2.0) * .1$



More noise
$(\text{noiseVec} * 5.0 - 0.0) * .01$

It proved difficult to make the high level of detail in the noise map to be visible when mixed with the color information of the landscape. Colors of the landscape give off a sense of depth and size that is lost when displacement is large. This often lead to what looks like the reflections of landscape in rippled water. When combined with the specular light, this unintentional result turns out to look pretty good.