CS 500
Project 4
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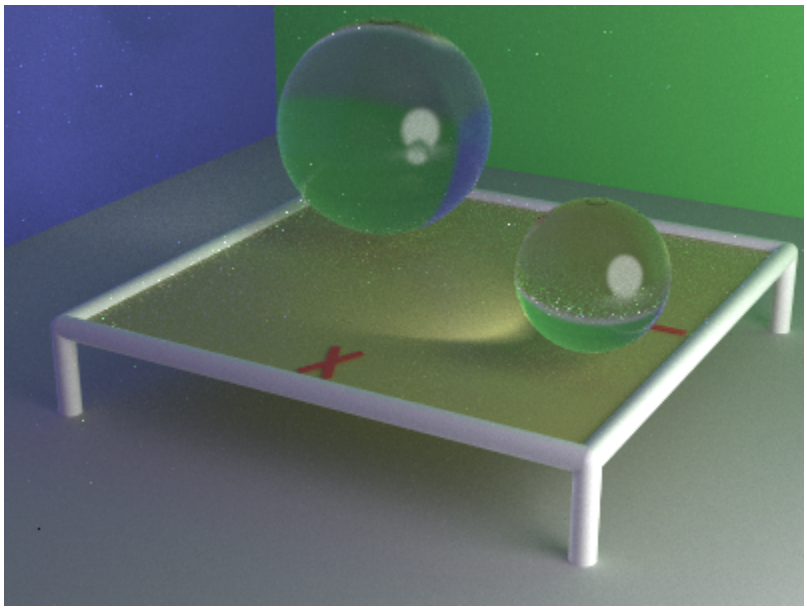
DigiPen

Remade the algorithms to not only accept and accommodate a new transmissive property, but also apply that to grant all the effects of light refracting into and through a transparent object. By happenstance of using these realistic light bounces, it comes with a large variety of scene enhancements to realism.

I modified my personal scene to contain a larger sphere and a second smaller sphere. Both the spheres have perfect transmission (1,1,1), zero diffuse, and an incredibly minor amount of specular (0.05, 0.05, 0.05). These values were selected to demonstrate the physical properties of transmissive objects, and the specular was used to give the orbs some depth in the render, akin to how you might expect a glass sphere to appear.



4096 cycles

This creates an outcome with flipped images through the spheres, as may be expected of a magnifying glass with high index of refraction.

It also grants some unique properties which may be expected of magnifying glasses, such as focusing the incoming light into a very bright light patch behind each sphere. This is most obvious from the small sphere redirecting light onto the table, but may also be observed from the large sphere brightening the floor and wall behind it.

Additionally, not *specifically* a demonstration of transmission, but the large sphere has an interesting reflection in it that contains the light sphere, cut off at the bottom by the smaller

sphere whose structure also makes a circle of light. This is a basic part of ray tracing, where objects are colored based on the surrounding scene, but it is still an effect I find fascinating and satisfying.

Some earlier renders, for reference:

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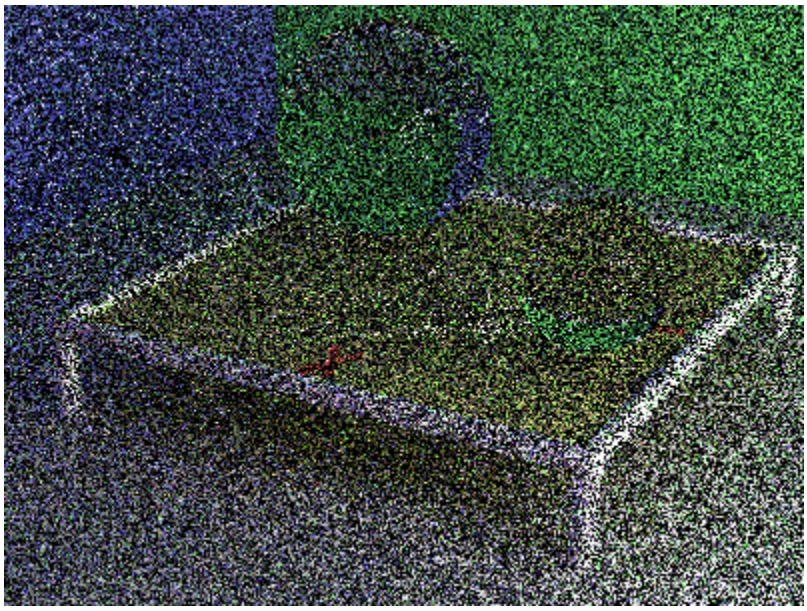
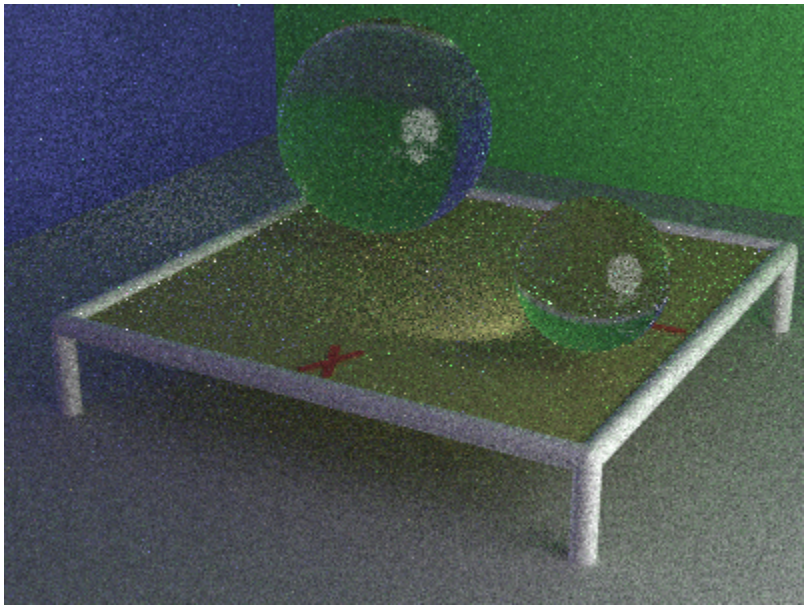
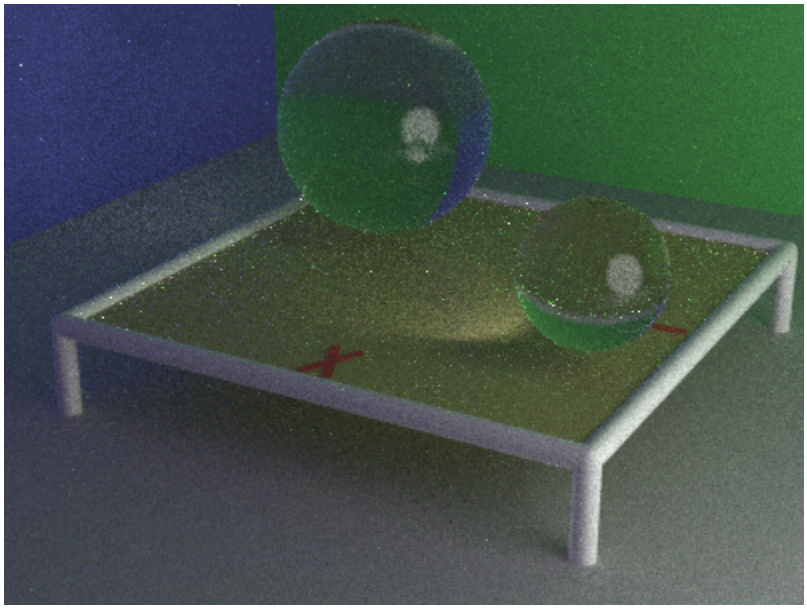


64



256



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