

# Anaglyph Images using a Raytracer

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My methods for creating my images involved modifying a raytracer from a previous course to generate a left and right eye image. Then I merged the images based on the pixel width to create the following anaglyph images. To create the color images, I took the red channel of the left eye and the blue and green channels of the right and combined them together to create the red cyan mix for the image. Greyscale images are created by using the following combination of grey: Left Grey, Right Grey, Right Grey.

To calculate the amount of pixels need to be shifted over to overlap the images for parallel cameras, it required taking the camera offset and dividing by the pixel width. The pixel width is found by taking the view plane width and dividing by the x resolution of the right and left eyes. The new resolution of the final image is then calculated by taking the x resolution of the eyes and subtracting the shifted pixel count.

```
float pixelWidth = getPixelWidth(p.width, p.res_x);
#define ABS(x) ( x < 0 ? -x : x )
int shiftPixels = (!toe ? ABS(((shift[0] / pixelWidth) - 1)) : 0);
int newXres = xres - shiftPixels;
```

When toeing the resolution does not change as the images are overlapped. To put the images together there must be an offset into the left image based of the shifted pixel count.

```
for (unsigned int y = 0; y < yres; y++) {
    for (unsigned int x = 0; x < newXres; x++){
        unsigned int leftX = x + shiftPixels;
        unsigned int rightX = x;
        // Get Channels
        image[imageR] = newR;
        image[imageG] = newG;
        image[imageB] = newB;
    }
}
```

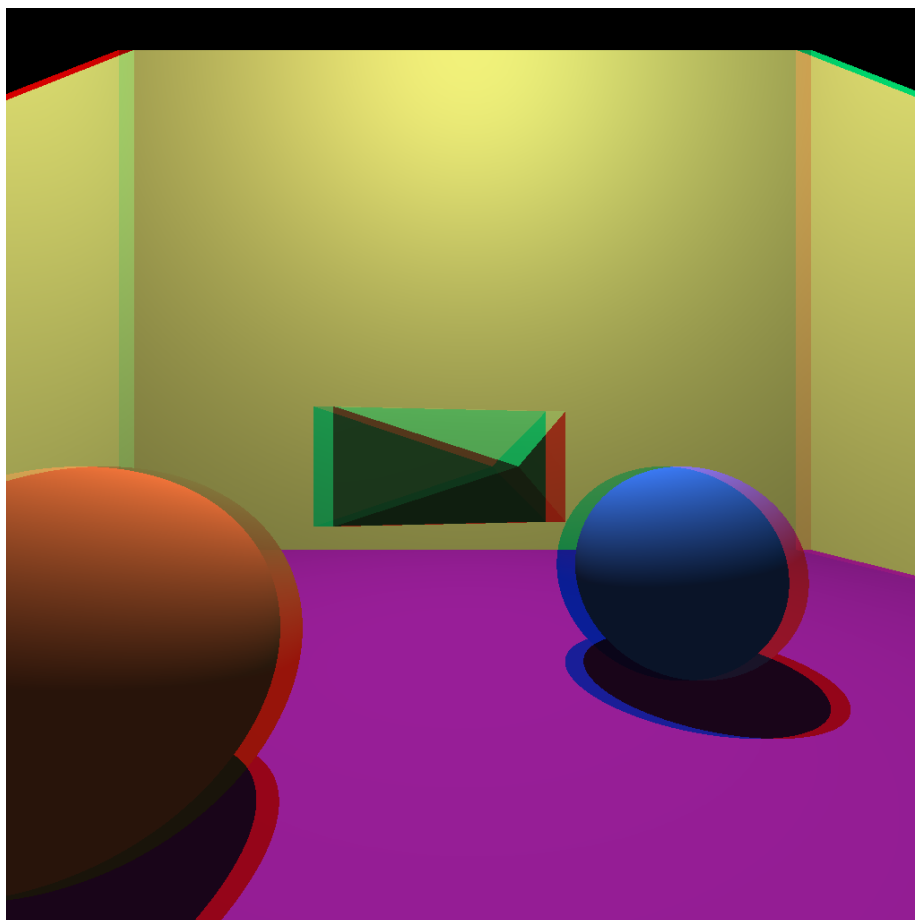


Figure 1: Parallel Cameras: 6cm eye distance Color

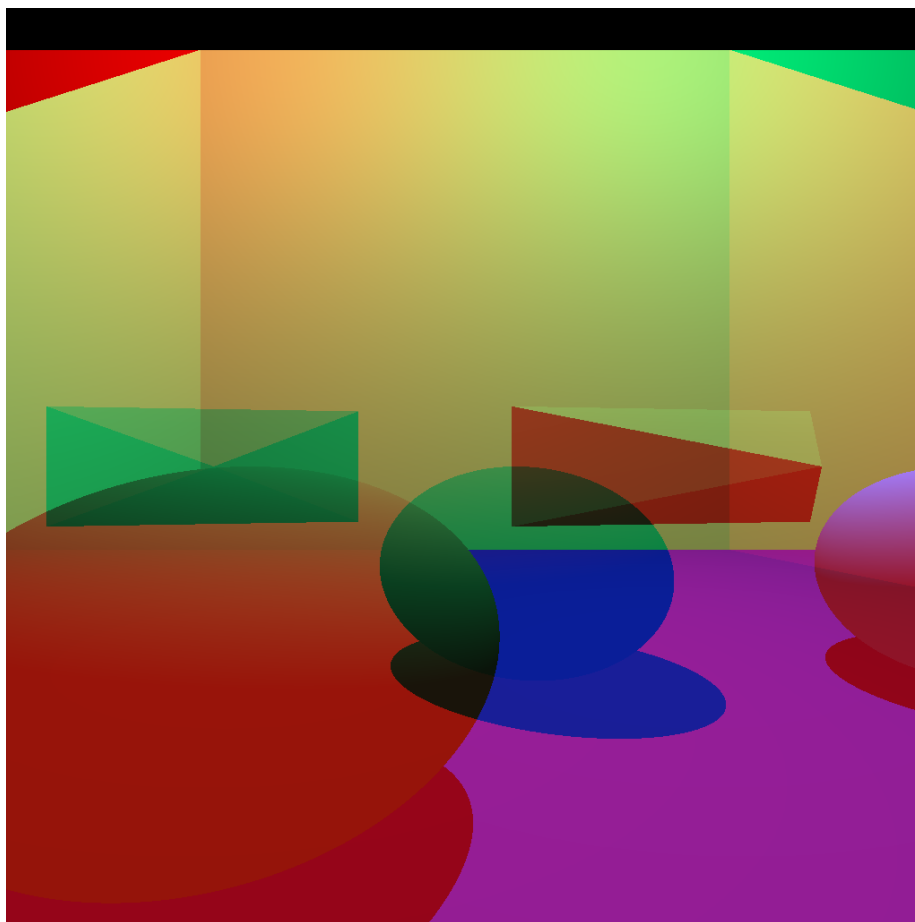


Figure 2: Parallel Cameras: 1m eye distance Color

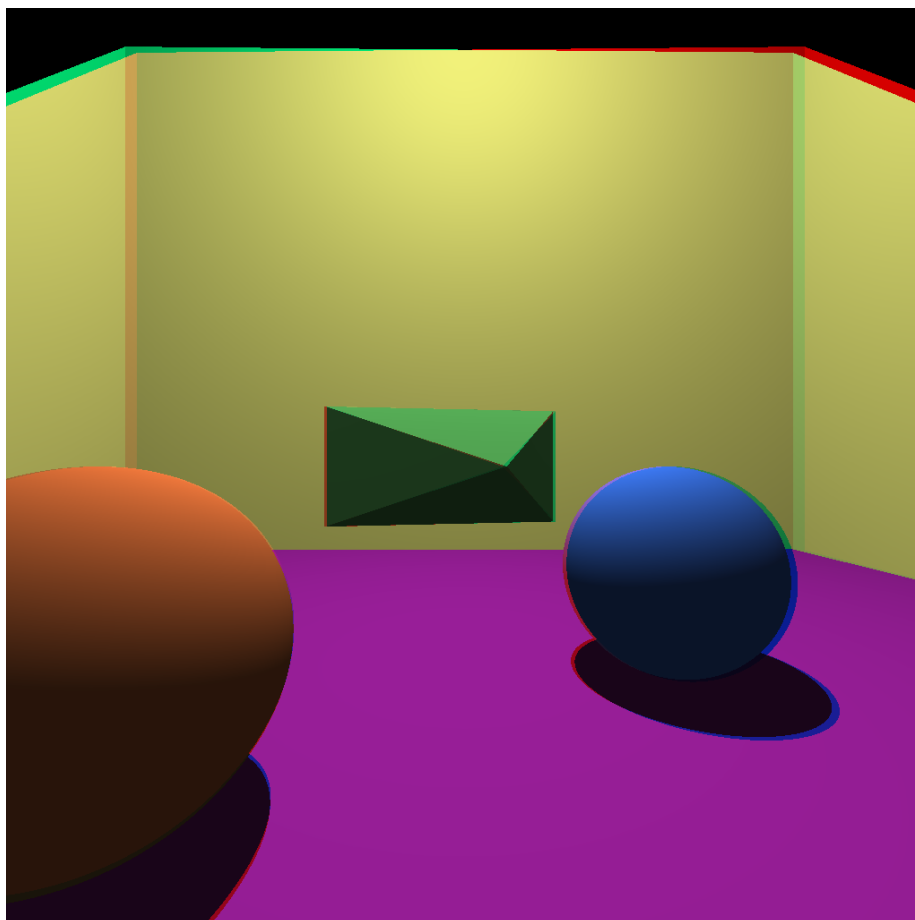


Figure 3: Toed Cameras: 6cm eye distance Color



Figure 4: Toed Cameras: 1m eye distance Color

## Notes on images

I found from my raytracer that when having overly large inner eye distance the effect falls apart and the images look terrible. However the small inner eye distance create a believe able image in both the toed and parallel cameras. Also because I had complete control over the scene, I did not have verical surround issues. However, you can see the keystone issue with the small eye distance and see exaterated with the large eye distance. For better large eye distances, the camera should be shifted back and the scene made more landscape-like.

## Other Images



Figure 5: LG Color Anaglyph Scene

File found at <http://commons.wikimedia.org/wiki/File%3ALGColorAnaglyphSceneMR.jpg> .

This scene was taken with 2 cameras 40cm apart for depth effect. This image uses a larger eye distance in a way that is better then mine. As one can see, the image looks very well. This was most likely done using a photo editing software to get the most pleasing effect, instead of programmicly like mine.