OPTI 600C Homework 3 Due: October 12, 2018

This homework involves creating a High Dynamic Range (HDR) image from a series of low dynamic range images. Please review the paper *Recovering High Dynamic Range Radiance Maps from Photographs* by Debevec and Malik in the zip file. Also included in the zip file are the images from their Figure 6, as well as details regarding the exposure settings for the images.

1. Select 10 points within the image that span the radiance range from very dark to very light. Plot their log Exposure vs. pixel value assuming unit radiance for each pixel. This should look something like the left-hand plot in Figure 2.
2. Implement the algorithm to find the response curve $g(Z_{ij})$ given in equation 2. HINT: there is Matlab code at the end of the paper that does this. Plot $g(Z_{ij})$ vs. pixel value. This should look something like the right-hand plot in Figure 2.
3. Create a radiance map like the one shown in Figure 8d using the results in equation 6.
4. Displaying this high dynamic range image is rather involved. We discussed the bilateral filter in class which is a popular local filter used to calculate a displayable image. Here we'll do something simpler, but not as visually appealing. Take the log() of your radiance map, scale the values to 0..255 and create an image.