**Group D: Image Set Alignment, Georgia O’Keeffe Museum**

For our project, we were tasked with testing whether or not changing the ISO plays a significant role when generating the normal map. Standard usage of the dome recommends that users should only capture data with ISO 100 and we had to prove if this restriction is necessary. To test this theory, we first took 5 sets of images at each ISO setting (100, 200, 400, 800, 1600, 3200, 6400, 12800). After gathering all of our data sets, we then ran the different sets through a script to create the RTI file. After the RTI files were generated, we then pulled the normal maps from them.

Next, we put these normal maps through our matlab program. We first calculated the average error between the normal maps within a single set in order to get an averaged value for each set. In our selection of ISOs, we found that the calculated error within a single set fluctuated between 0.1544**°** to 0.302**°**. This gave us an idea of how consistent each ISO was for gathering the normal data and some idea for what at least might be the minimum expected error when we ran our next test and compared each ISO to ISO 100. After this first test was done, we ran our main test and took those averaged values at each ISO and compared them to the averaged values of ISO 100 in order to calculate the average angle change. What we found after running this test was that the calculated difference between ISO 100 and the other ISOs ranged from 0.2005**°** to 0.4829**°**. Our data shows that there was a steady increase in the calculated difference as the ISO went up. To test the accuracy of our program and measurements, we ran a couple checks. One check we did was rotating one of the images and then comparing it to ISO 100 to insure that our algorithm was correctly comparing images, which it was.

From our experiment, we found that while there is a difference between ISOs, the percentage error is so minuscule it should not really matter. Our findings only apply to lower resolution images however, and the difference between higher resolution images may be much higher.