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https://github.com/psturmfels/alpha_communication

Assignment 3

Below we plot the measured data rate and bit error rates for when the change in opacity (delta alpha) is visible to the human eye – plotted in orange (delta alpha = 0.1) – and the largest change in opacity that is not visible to the human eye – plotted in blue (delta alpha = 0.01). It appears we can get perfect communication when the delta alpha is visible the human eye at any of the measured ranges, whereas when the delta alpha is small, error starts to increase quickly when the distance increases beyond 40cm. Intuitively, this makes sense – for small values of delta alpha, as we get farther and farther away from the screen, ambient lighting conditions and hardware noise interfere with the measured signal. However, for large values of delta alpha, the opacity change is still large enough to overcome those sources of noise.