CS 4390: HW 3

Written by Zach Leach, NetID: zcl190002

Draft February 20, 2024

1 Data rate problem

It is desired to send a sequence of computer screen images over optical fiber. The screen is 3840×2160 pixels, each pixel being 24 bits. There are 60 screen images per second. What data rate is needed?

$$\text{Data Rate} = \frac{\text{Number of bits}}{\text{Bits per second}}$$

To find the bits per second quantity, first calculate the number of bits in an image. There are $24 \text{ bits} \cdot (3840 \times 2160) = 199{,}065{,}600$ bits per image.

There are 60 of these images being transmitted per second, therefore the data rate is $60 \cdot 199,065,600 = 1.194 \cdot 10^{10}$.

2

3

4

5

6

7