CS 474: Final Project Proposal

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The goal of this project is to replicate the results of the paper *Controlling Perceptual Factors in Neural Style Transfer* by Gatys et al. 2017. In the paper, the authors use a technique called "neural style transfer" to transfer the style of one image onto the content of another image, which we previously discussed in class and implemented in the homework. The authors of the paper then go on to show that they can extend this technique to control the perceptual factors of the resulting image, such as the color, location, and spatial scale. This is done by adding a loss function to the optimization problem that is minimized during the neural style transfer which depends on the perceptual factors of the resulting image.

My approach to this project will be to implement the neural style transfer algorithm as described in the paper and then extend it to control the perceptual factors of the resulting image. I will use images that are open source and available online to test the algorithm. I will use the same loss functions as the authors of the paper and I will use the same optimization algorithm. For the luminance transfer, I will use the same method as the authors of the paper, which is the same as the method used in *Image Analogies* by Hertzmann et al. 2001.

The measures of success for this project will be the ability to transfer the style of one image onto the content of another image and the ability to control the perceptual factors of the resulting image. I will measure the success of the neural style transfer algorithm by comparing the resulting image to the original image and to the images that the authors of the paper used. Naturally, whether or not the results are visually pleasing is a subjective measure of success.