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Neural Networks
Project Proposal

I would like to investigate the use of neural networks on image data. Specifically, I would like to specifically investigate the idea of training a network on image data and seeing what sort of results I can get back. If all goes well, I would like to take a look at how feasible it is to use these networks for image compression.

I have given a cursory look through existing papers on the subject and there seems to be a lot of work already in existence on the topic. I found the papers “Neural Network Approaches to Image Compression” by Robert Dony and “Image Compression with Neural Networks – A Survey” by J. Jiang to be especially helpful.

Whereas most of these techniques tend to input multiple pixel color values of an image of size 4 by 4, 8 by 8, or 16 by 16, I would like to take a look at using the coordinates of pixels as the input and trying to get color information out as the output. While I am not overly optimistic about this type of network’s abilities to compete against established image compression schemes, I am interested in seeing how they do and if there are any kind of images for which they perform especially well.

As another alternative, I might also take a look at using these networks for recognition of “figure vs. ground” images that take the form of silhouettes. I might work at recognizing various shapes or something of the sort.