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November 1, 2023
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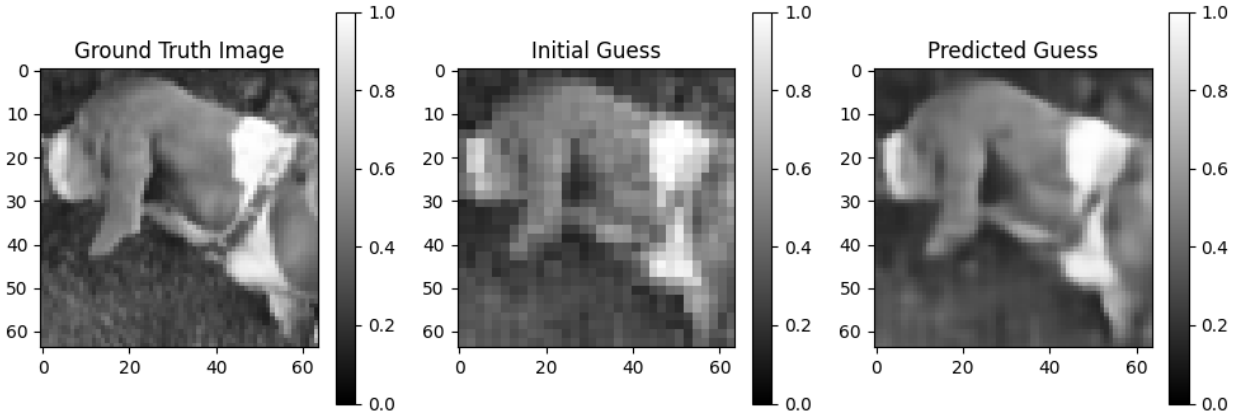
ENGS 117

Deliverables for Project 4

1. I implemented a U-Net architecture for the deep neural network. In terms of the activation function, I used the ReLU function in the encode and decoder layers, and then a sigmoid function in the output layer. In terms of what layers I used, starting from the input layer, I had a couple convolution layers followed by max pooling up until we have a convolution with 256 filters. Then, reversing what I just did, the function upsamples and does a convolution a couple times until I get to the output layer. The number of parameters trained here is 922881. Lastly, I set the loss function to mean squared error.

2. The training uses the default 32 batches and 20 epoches (the loss function has plateaued by this point). The final training and validation loss is 0.0032 and 0.0031 respectively.

3. The MSE when predicting the results of the test data is. 0.0030660217162221 67. Below is an example of a predicted image:



4. Beyond having better data to begin, i.e. more of it or images less compressed to begin with, a couples ways to improve my model in the future could be by tuning with grid searches my hyperparameters like batch number or kernel size or number of convolution layers, or simply by using a different architecture that is more advanced.

https://colab.research.google.com/drive/129kNjUpaw7iJXkHjJdqmrOzu76sxpoqy?usp=sharing
I attached the downloaded document but you can also just follow this link instead. Also note that all graphs/data are visible in the colab as well