Replicating LSD

Using the LSD repo (https://github.com/cchen156/Learning-to-See-in-the-Dark.git) on GitHub I was able to partially replicate Chen et. al. 2018. Their code worked perfectly. I ran into limitations with computational resources.

Hardware

1. Using AWSEducate did not work
   - Unable to create roles with IAM authentication so it's really hard or impossible to move data from a S3 Bucket to an EC2 Instance
   - Tried to create a `P3.8xlarge` instance but these instances are not allowed even though they are listed
2. Using regular AWS does work but costs money
   - Ran a single AWS EC2 `p3.8xlarge` instance with 32 CPU, 244 GB of Memory, 4 Tesla V100 GPUs, and 64 GPU Memory. This costs $12.24 an hour.
   - This is the amount of GPU Memory requested by the paper authors as a minimum amount

Run Time

I ran model training for 90 minutes, testing on the trained model parameters failed. I extracted the papers model parameters and then used those for testing which lasted 30 minutes. Some time was required to extract the Sony dataset which came in at around 115GB of decompressed images.

Training Results

Training results are available in the attached log file `train_sony.log`. In 90 minutes, I was able to get through 11 epochs. The code requires 4000 epochs to run. At 2000 epochs, the code updates the learning rate to an order of magnitude lower.

Test Results from Training Parameters

I was not able to get trainable parameters out of the 11-12 epochs based on how the code is currently written; which could then be run using the testing script. Results of this step are in `test_sony.log`. I did not take any debugging steps, just noted the errors when they were raised using the log file.

Test Results from LSD Model Parameters

Test results are logged using `test_model_params_sony.log` but that log doesn't say anything interested. Results were written out to a `result_Sony` folder which I will be sharing when the upload is complete. It contains the processed images and looks pretty nice. This is encouraging because it shows that the authors code was clearly run correctly.