



# ALPhA: week 5

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# Last Week Summary

- Met with Gagik
- Began making an evaluation script for our CNN
- Began experimenting with more pre-trained convnets to try to increase accuracy
- Worked to further understand how Pix2Pix works
  - Calculated the MSE per pixel of our generated images

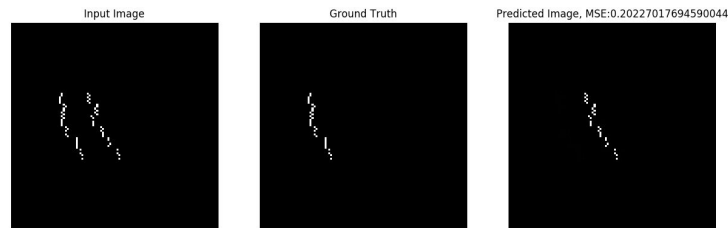
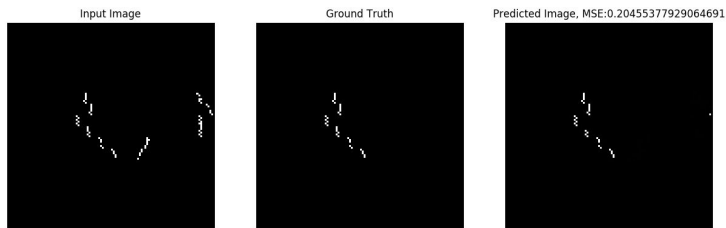
# CNN Evaluation Script

- Evaluated our VGG16 Model
  - Accuracy: 89.5%
  - Time per prediction: 3 ms
  - Desired time per prediction: <5 ms
- Next Models to Evaluate
  - Xception
  - Inception V3
  - Resnet
  - VGG19

```
hoyle@PHY1kuchera: ~/Hall_b
10464/11110 [=====] - ETA: 1s - loss: 0.3344 - accuracy: 0.8
10496/11110 [=====] - ETA: 1s - loss: 0.3342 - accuracy: 0.8
10528/11110 [=====] - ETA: 1s - loss: 0.3336 - accuracy: 0.8
10560/11110 [=====] - ETA: 1s - loss: 0.3334 - accuracy: 0.8
10592/11110 [=====] - ETA: 1s - loss: 0.3331 - accuracy: 0.8
10624/11110 [=====] - ETA: 1s - loss: 0.3329 - accuracy: 0.8
10656/11110 [=====] - ETA: 1s - loss: 0.3324 - accuracy: 0.8
10688/11110 [=====] - ETA: 1s - loss: 0.3322 - accuracy: 0.8
10720/11110 [=====] - ETA: 0s - loss: 0.3319 - accuracy: 0.8
10752/11110 [=====] - ETA: 0s - loss: 0.3331 - accuracy: 0.8
10784/11110 [=====] - ETA: 0s - loss: 0.3358 - accuracy: 0.8
10816/11110 [=====] - ETA: 0s - loss: 0.3353 - accuracy: 0.8
10848/11110 [=====] - ETA: 0s - loss: 0.3350 - accuracy: 0.8
10880/11110 [=====] - ETA: 0s - loss: 0.3346 - accuracy: 0.8
10912/11110 [=====] - ETA: 0s - loss: 0.3342 - accuracy: 0.8
10944/11110 [=====] - ETA: 0s - loss: 0.3343 - accuracy: 0.8
10976/11110 [=====] - ETA: 0s - loss: 0.3341 - accuracy: 0.8
11008/11110 [=====] - ETA: 0s - loss: 0.3339 - accuracy: 0.8
11040/11110 [=====] - ETA: 0s - loss: 0.3337 - accuracy: 0.8
11072/11110 [=====] - ETA: 0s - loss: 0.3331 - accuracy: 0.8
11104/11110 [=====] - ETA: 0s - loss: 0.3327 - accuracy: 0.8
11110/11110 [=====] - 29s 3ms/sample - loss: 0.3328 - accuracy: 0.8948
cy: 0.8948
Restored model, accuracy: 89.48%
(Hall_b) hoyle@PHY1kuchera:~/Hall_b$
```

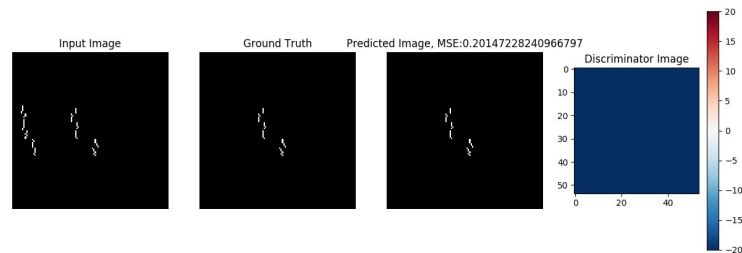
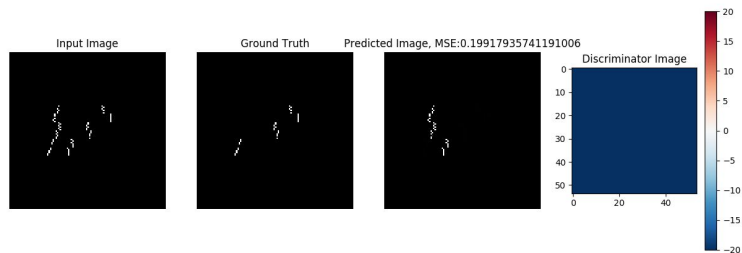
# Pix2Pix Progress

- Generated more example images
  - Accuracy is wack
    - Some images great others not so great
- MSE per pixel is now calculated for every image
  - Also kind of wack
    - All values around 0.202 despite apparent accuracy



# Pix2Pix Progress (Continued)

- Images now produce our input, target, generated, and discriminator images
  - Discriminator images are made from running our prediction and target image through our discriminator function





# Possible ways to fix Pix2Pix

- Need metrics to measure quality of our images
  - MSE
  - Average loss per image
- New discriminator loss function?
  - Hesitant since we get some good results with our current loss function
- Experiment with different learning rates or patch sizes
  - Current learning rate for both structures:  $2e-4$
  - Current final PatchGAN patch size: (bs, 54, 54, 1)



# Next Steps

- Continue amassing CNN checkpoints for different models
- Continue working on implementing methods to track evaluation metrics