

COMP4660/8420 Introduction to GAN and RL

Part 1. Theory questions

1. What is the main difference between the Generator and the Discriminator in a GAN that produces images?

The Discriminator is a CNN that determines whether the input is real or fake. The Generator uses convolutional transpose layers to try and create an image from a given input.

2. What is the goal of unsupervised pre-training?

To learn features of the data (patterns and structure) that are likely to be useful to the supervised learning problem.

Part 2. Practice questions

GAN

For the GAN code you will need to fill in the three lines of missing codes to get it running.

GAN optional advanced

An advanced part is getting it to run on one of the other datasets that are commented out at the top. Both the Generator and Discriminator need to be adjusted to account for the different image sizes.

Transfer learning

The transfer learning part is an example of the CNN MNIST problem with a reduced labelled training set size. Pretraining is done using a slightly modified version of net D from the GAN example. To use the pretrained weights uncomment line 116 (`model.load_state_dict ...`). Notice the difference in the test set accuracy between the trained from scratch and pretrained versions and the difference in overfitting.

Q1. What is pretraining with the GAN an example of?

Unsupervised pretraining

Q2. What type of transfer learning is this an example of?

Semi-supervised learning