

ECS795P Deep Learning and Computer Vision, 2022

Course Work 2: Unsupervised Learning by Generative Adversarial Nets

1. Understanding basic concepts in GAN models

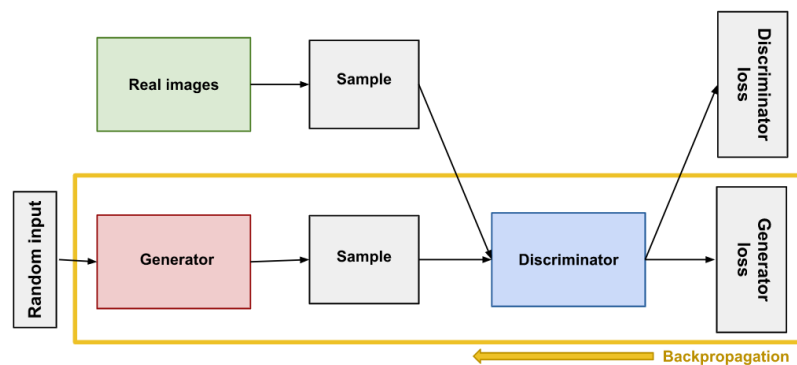
What are the specific objectives of these two parts?

A Generative adversarial networks(GAN) has two parts namely, Generator and Discriminator. The objectives of two parts have been discussed as below:

The Generator:

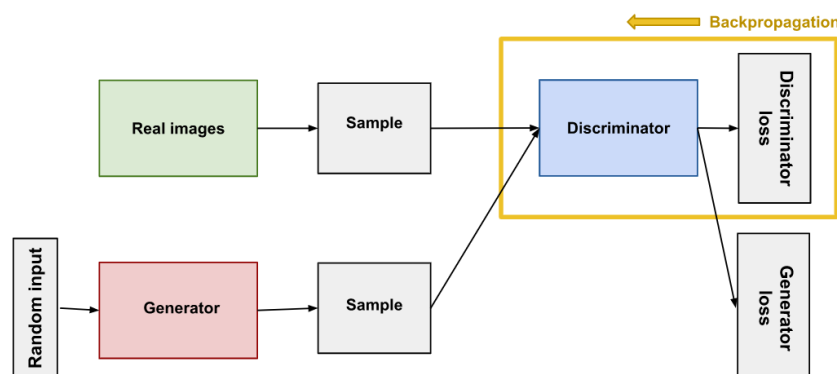
The generator component of a GAN learns to generate fake data by incorporating discriminator feedback. It learns to manipulate the discriminator so that its output is classified as real. Generator training necessitates a closer integration of the generator and the discriminator than discriminator training necessitates. The part of the GAN that trains the generator is as follows:

- random input
- generator network that transforms the random input into a data instance
- discriminator network that classifies the generated data discriminator output
- generator loss that penalises the generator for failing to fool the discriminator



Discriminator:

The discriminator acts a classifier which attempts to distinguish between real data and data generated by the generator(usually fake data, that is can be considered as replica of the original data). It could use any network architecture suitable for the type of data it's classifying.



2. Generative Adversarial Networks with PyTorch

Exercise:

1. Remove dropout function for this architecture and plot its training loss.

#CODE:

```
self.fc1 = nn.Sequential(  
    nn.Linear(input_dims, 1024),  
    nn.LeakyReLU(0.2),  
    #nn.Dropout(0.3) #removing the dropout rate  
)  
self.fc2 = nn.Sequential(  
    nn.Linear(1024, 512),  
    nn.LeakyReLU(0.2),  
    #nn.Dropout(0.3) #removing the dropout rate  
)  
self.fc3 = nn.Sequential(  
    nn.Linear(512, 256),  
    nn.LeakyReLU(0.2),  
    #nn.Dropout(0.3) #removing the dropout rate  
)  
self.fc4 = nn.Sequential(  
    nn.Linear(256, 1),  
    nn.Sigmoid()  
)
```

#OUTPUT

