The Discriminator

The discriminator in a GAN is simply a classifier. It tries to distinguish real data from the data created by the generator. It could use any network architecture appropriate to the type of data it's classifying.

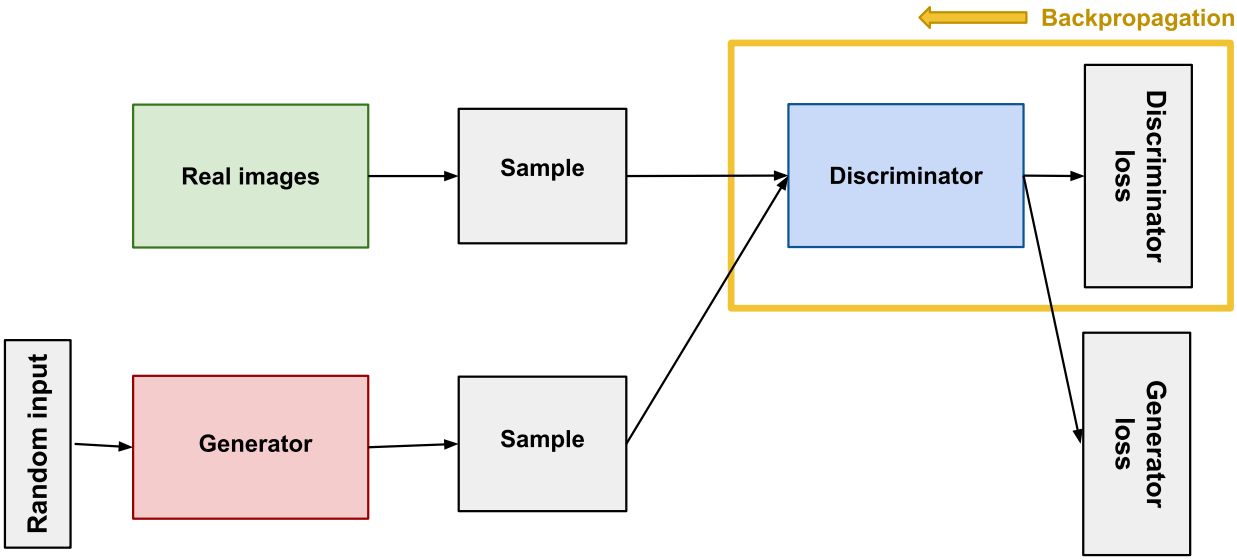

Figure 1: Backpropagation in discriminator training.

Discriminator Training Data

The discriminator's training data comes from two sources:

- **Real data** instances, such as real pictures of people. The discriminator uses these instances as positive examples during training.
- **Fake data** instances created by the generator. The discriminator uses these instances as negative examples during training.

In Figure 1, the two "Sample" boxes represent these two data sources feeding into the discriminator. During discriminator training the generator does not train. Its weights remain constant while it produces examples for the discriminator to train on.

Training the Discriminator

The discriminator connects to two loss (/machine-learning/glossary#loss) functions. During discriminator training, the discriminator ignores the generator loss and just uses the

discriminator loss. We use the generator loss during generator training, as described in the next section (/machine-learning/gan/generator).

During discriminator training:

1. The discriminator classifies both real data and fake data from the generator.
2. The discriminator loss penalizes the discriminator for misclassifying a real instance as fake or a fake instance as real.
3. The discriminator updates its weights through backpropagation (https://developers.google.com/machine-learning/glossary/#b) from the discriminator loss through the discriminator network.

In the next section we'll see why the generator loss connects to the discriminator.

Previous
← Overview of GAN Structure (/machine-learning/gan/gan_structure)

Next
Generator (/machine-learning/gan/generator) →

Last updated 2019-05-24 UTC.