Introduction 🔖

Welcome to Introduction to...

Generative adversarial networks (GANs) are an exciting recent innovation in machine learning. GANs are *generative* models: they create new data instances that resemble your training data. For example, GANs can create images that look like photographs of human faces, even though the faces don't belong to any real person. These images were created by a GAN:
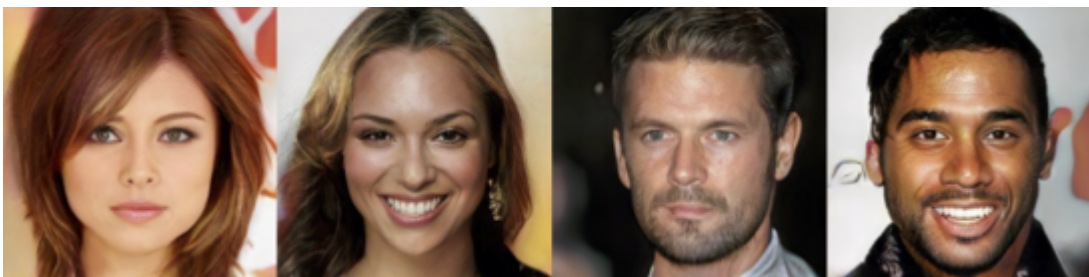

Figure 1: Images generated by a <u>GAN created by NVIDIA</u>
 (https://research.nvidia.com/sites/default/files/pubs/2017-10_Progressive-Growing-of/karras2018iclr-paper.pdf)

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GANs achieve this level of realism by pairing a generator, which learns to produce the target output, with a discriminator, which learns to distinguish true data from the output of the generator. The generator tries to fool the discriminator, and the discriminator tries to keep from being fooled.

This course covers GAN basics, and also how to use the TF-GAN library to create GANs.

ᵉ Learning Objectives

Understand the difference between generative and discriminative models.

Identify problems that GANs can solve.

Understand the roles of the generator and discriminator in a GAN system.

Understand the advantages and disadvantages of common GAN loss functions.

Identify possible solutions to common problems with GAN training.

Use the TF GAN library to make a GAN.

Prerequisites

This course assumes you have:

- Completed <u>Machine Learning Crash Course</u> (/machine-learning/crash-course) either in-person or self-study.

- At least a little experience programming with <u>TensorFlow</u> (https://tensorflow.org)