Generative Adversarial Networks

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Generative Adversarial Networks (GANs) are neural networks that are trained in an adversarial manner to generate data mimicking some distribution. The main idea behind a GAN is to have two competing neural network models. One takes noise as input and generates samples (and so is called the generator). The other model (called the discriminator) receives samples from both the generator and the training data, and has to be able to distinguish between the two sources. These two networks compete with each other, where the generator is learning to produce more and more realistic samples, and the discriminator is learning to get better and better at distinguishing generated data from real data. These two networks are trained simultaneously, and the aim is to generate samples to be indistinguishable from real data[1]. This class of artificial intelligence algorithms used in unsupervised machine learning was introduced by Ian Goodfellow et al. in his paper "Generative Adversarial Networks"[4][5]. There are many advancement to this topic which were used in different applications such as "WaveNet: A Generative Model for Raw Audio" by DeepMind[3][7], "Photo-Realistic Single Image Super-Resolution Using a Generative Adversarial Network" by Christian Ledig[6], "Image De-raining Using a Conditional Generative Adversarial Network" by He Zhang, Vishwanath Sindagi, Vishal M. Patel[8], "Video Imagination from a Single Image with Transformation Generation" by Baoyang Chen, Wenmin Wang – 2017[2].
My aim is to study the working and advancements in Generative Adversarial Networks and conduct a seminar discussing my observations and explain how the GANs work in these applications.

Word Count: *255*

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