برداشتی از ۴ مقاله GANS

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A Gentle Introduction to Generative Adversarial Networks (GANs)

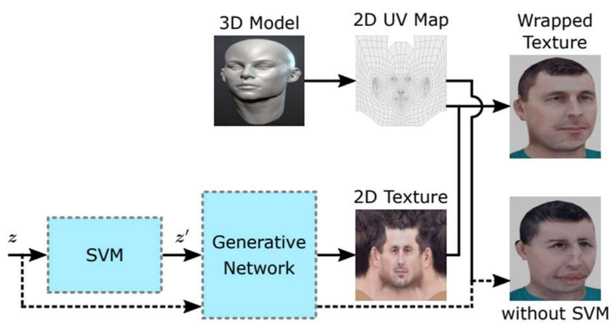
Generative Adversarial Networks, or GANs for short, are an approach to generative modeling using deep learning methods, such as convolutional neural networks.Generative modeling is an unsupervised learning task in machine learning that involves automatically discovering and learning the regularities or patterns in input data in such a way that the model can be used to generate or output new examples that plausibly could have been drawn from the original dataset.GANs are a clever way of training a generative model by framing the problem as a supervised learning problem with two sub-models: the generator model that we train to generate new examples, and the discriminator model that tries to classify examples as either real (from the domain) or fake (generated). The two models are trained together in a zero-sum game, adversarial, until the discriminator model is fooled about half the time, meaning the generator model is generating plausible examples.GANs are an exciting and rapidly changing field, delivering on the promise of generative models in their ability to generate realistic examples across a range of problem domains, most notably in image-to-image translation tasks such as translating photos of summer to winter or day to night, and in generating photorealistic photos of objects, scenes, and people that even humans cannot tell are fake

A Gentle Introduction to StyleGAN

The Style Generative Adversarial Network, or StyleGAN for short, is an extension to the GAN architecture that proposes large changes to the generator model, including the use of a mapping network to map points in latent space to an intermediate latent space, the use of the intermediate latent space to control style at each point in the generator model, and the introduction to noise as a source of variation at each point in the generator model.The resulting model is capable not only of generating impressively photorealistic high-quality photos of faces, but also offers control over the style of the generated image at different levels of detail through varying the style vectors and noise.

FACE TEXTURE GENERATION

In this article, we intend to create artificial data that does not exist, and based on the previous data training and the given training, the machine creates a new artificial data that did not exist before, for example, creating a new face or new features. To automatically create textures from existing 3D scans, we turn to Deep Learning and specifically Generative Adversarial Networks (GANS). Adapting the 2D model to the 3D model requires correct mapping so that the texture is placed correctly and the sample is made correctly. For this, a UV map of the 3D image is used to match the 2D texture. This can be seen in Figure 1.



Using GANs with adaptive training data to search for new molecules

The process of drug discovery involves a search over the space of all possible chemical compounds. Generative Adversarial Networks (GANs) provide a valuable tool towards exploring chemical space and optimizing known compounds for a desired functionality. Standard approaches to training GANs, however, can result in mode collapse, in which the generator primarily produces samples closely related to a small subset of the training data. In contrast, the search for novel compounds necessitates exploration beyond the original data. Here, we present an approach to training GANs that promotes incremental exploration and limits the impacts of mode collapse using concepts from Genetic Algorithms. In our approach, valid samples from the generator are used to replace samples from the training data. We consider both random and guided selection along with recombination during replacement. By tracking the number of novel compounds produced during training, we show that updates to the training data drastically outperform the traditional approach, increasing potential applications for GANs in drug discovery