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**Image generation using generative adversarial networks**

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**Abstract:**

Ever heard of generation of image datasets, human faces, cartoon characters, 3D objects, image-to-image and text-to-image translation, face aging, photo blending, and others? How are the computers able to perform the tasks by achieving mastery results? Yes, the answer to all these tasks is generative adversarial networks (GANs). GANs are an amazing artificial intelligence innovation fit for making pictures, sound, and recordings that are unclear from the real thing. GANs employ self-supervised learning consisting of two neural networks. The setup includes two neural network systems in opposition to one another—one to create fakes (generator) and one to spot them (discriminator). The term generative indicates the idea of creating new data depending on the training data. The term adversarial indicates a gamelike framework with two networks, i.e., generator and discriminator. The generator produces the realistic data, which is similar to the training data, whereas the discriminator's task is to identify fake data produced by the generator from the real data coming from the training sample. The chapter is divided into three sections providing a brief introduction about generative deep learning and variational autoencoder giving the flexibility of data generation with slight variations compared to the original data followed by the workflow, training problems, and real-world applications using different flavors of GANs.