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GANs is changing the face of advertising

The Generator does not make exact copies of the original but learns the underlying structure from it. So it may produce an output that looks and feels like the original.

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By [Rahul De'](#), [Dhanvi Kamath](#), [Anamika Saha](#)

In a recent series of advertisements on YouTube, [Shah Rukh Khan](#), one of India's most famous brand ambassadors, was seen promoting neighbourhood shoe, Kirana, and grocery stores. In carefully scripted ads, he mentioned their names and encouraged viewers to use their services. How was this possible? These seemed like fake ads, where some imposter was imitating, quite accurately, the famous actor's style, voice, and mannerisms. Otherwise, how could neighbourhood shoe and Kirana stores afford a superstar to publicize their brand?

Shah Rukh Khan indeed made some video ads for a large company, [Cadbury chocolates](#), who could afford his fees, and then allowed the video to be manipulated by an Artificial Intelligence (AI) technology called [Generative Adversarial Networks \(GANs\)](#). These are special kinds of neural networks that create [data patterns](#) according to certain criteria. This technology was used to

generate voice tracts that replicated the actor's speech style and voice quality. Then video footage was created that lip-synced his video tracks to say the different phrases needed for the ads.

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GANs work on a competitive principle. They consist of two neural networks, one that tries to create variations of some given pattern and another that tries to figure out whether the pattern is the original or an imitation. In this competition, the Generator, the one that tries to create copies, attempts to outsmart the other network, called the Discriminator, by repeatedly making patterns that begin to resemble the original. The Generator does not make exact copies of the original but learns the underlying structure from it. So it may produce an output that looks and feels like the original. This competition results in patterns, which may be images or videos or sounds, that are reproduced, but not exactly. They look, move, and sound like the original, but they are not originals.

GANs have found many commercial uses. Fashion firms enable the same model to wear different clothes by simulating the colours, styles, fits, and sartorial assemblages with GANS. Further, with the different styles and fashions, the models are imaged in different poses. This saves firms the effort, and the cost, of making the models actually wear so many different styles and colours. This technology is also used to create many different designs from the same basic pattern. For example, the basic designs of fashion items like shoes and handbags can be re-generated in different forms and fashions, based on a style. This can be done for other consumer objects as well, such as cars, bicycles, furniture, and even buildings.

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Some of the most impressive uses of GANs are in medical technology. Consider the case of imaging used to detect the tissue composition of a tumour. Sometimes the resolution of the image is not good enough, as the equipment used to create the image may have been old or malfunctioning, or the technician was not skilled enough to capture an appropriate image. GANs can be used to enhance these, where the Generator is trained to create high-resolution images from grainy or low-resolution ones, and the Discriminator helps by discerning an enhanced from a distorted image. The GAN technology then enables doctors to see a sharp version of the image to diagnose the cause of the tumour.

This facility becomes critical in some situations - sometimes patients cannot be given high doses of radiation, which is required for high-resolution tomography imaging. In such cases, low-resolution images are created and sharpened with GANs. Patients are thus spared from being subjected to excessive radiation, thus protecting their already fragile tissues.

This technology is also being used in basic scientific work. Cosmologists often have to choose between a wide image that includes a lot of stellar objects, but that has a low resolution and a narrow image that has a sharper focus and includes more details. This tradeoff is now being resolved by taking wide images and using GANs to sharpen parts of them to obtain details.

The fundamental question this technology raises for us is whether these produced images (or videos or sounds or designs) are artificial or real. They are different from direct copies, and are also not cleverly manipulated "fakes". If they are treated as fakes, then their use in medical diagnosis or in science has to be

questioned and avoided. However, if they are a different form of "real", then we can go ahead with their use in all endeavours where they are useful. The answer to this question is not easy. We will have to conclude that Shah Rukh Khan did make those ads for the Kirana store. And, also, that he did not.

(Rahul De' is Professor of Information Systems, Dhanvi Kamath and Anamika Saha are MBA students, at [IIM Bangalore](#).)

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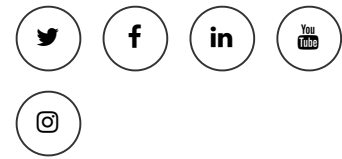
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