HOW TO IMPROVE VIDEO QUALITY WITH ARTIFICIAL INTELLIGENCE

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Annotation: This article discusses the idea of processing video images using artificial intelligence. The benefits of artificial intelligence in video image processing are listed.

Key words: Artificial intelligence, video quality, formats, pixels, media, Full HD, Ultra HD, High Definition
,
Digital Cinema.

Videos are much more popular among social media users than pictures or text.

With the development of the speed and quality of the Internet connection, the popularity of online content and video streaming services is growing: YouTube, Netflix, Hulu, HBO Go, Amazon Prime. Therefore, brands and individual media personalities, having picked up this trend, began to actively release high-quality visual content in order to meet the requirements of the audience. The important thing for the media industry is that Ultra HD images or videos can be edited without losing picture quality. By the way, we already wrote about the image enhancement technology in the previous article. But what about old low-res movies, commercials, home videos? Is it possible to improve their quality for comfortable viewing on modern screens? Let's find this out.

How to improve video quality at the expense of resolution

First, let's list the most common permission types and terms. The resolution is usually given in the format width x height of the screen in pixels:

1920 x 1080: Full HD (High Definition)
2048 x 1080: 2K (Digital Cinema)
3840 x 2160: 4K (UHD - Ultra High Definition)
4096 x 2160: 4K (Digital Cinema)
7680 x 4320: 8K (UHD)
15360 x 8640: 16K (UHD)

Today, the generally accepted resolution standard is 4K, and we are moving towards 8K screens. Youtube started supporting 4K for uploading videos back in 2010, when many manufacturers started producing low-cost cameras in this format. Since then, 4K displays and smart TVs have dropped significantly in price and gain in popularity. Even though the human eye is unlikely to physically notice the difference in picture quality above 4K, the race for higher resolution continues.

What can the program for improving video quality do?

In a nutshell, Video Enhancement is the process of enhancing video quality. Professional video editors usually support the following features:

- scaling (upscale);

- improved lighting;

- stabilization;

- noise suppression;

- brightness control;

- cropping (cropping), video rotation, mirroring;

- filters; - effects and animation.

A video editor to improve the quality can give your old recording a second life.

Video upscaling is the process of converting lower resolution media to higher resolution. Base scaling is a way to "stretch" a lower resolution image onto a larger screen, usually with degradation and loss of detail. To enlarge an HD image on a 4K screen, you have to fill in an extra 6 million pixels. Therefore, the upscale program must determine what each of these new pixels will display, based on what the neighboring ones show (interpolation). Taking a low-resolution image, a deep learning algorithm (usually a generative neural network) predicts a higher-resolution image that, after compression, would look like our original input.

AI models are constantly being improved and their accuracy grows with each training cycle. In addition, different deep learning models can be applied to enhance different types of video content. And neural networks can also be combined: sometimes it gives amazing results. So, artificial intelligence helped to increase the famous "Arrival of a train at La Ciotat" (L'arrivée d'un train en gare de La Ciotat) to 4K. It is an 1896 French short black and white documentary directed by the Lumière brothers.

Instead of output. AI zooming in and out of video creates an effect that can be compared to a nearsighted person wearing glasses: it turns out that the world is full of details, trees have leaves, and road signs, signs and bus numbers can be easily read. At the moment, Full HD and 4K are still the most popular resolution formats for watching videos on the Internet and on TV, but the upper limit of picture quality has not yet been set. We specialize in developing personalized solutions for clients and can build MVP (minimum viable product) quickly and cost-effectively, which can be developed and scaled into a full-fledged product in the future.

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