Bruce Devlin

AI and ML

I have a problem with the phrase artificial intelligence (AI). It's a kind of catch-all term used to not only explain how Facebook's algorithms work (which no one seems to understand, not even Facebook) all the way to a dystopian future involving robots that claim to be alive. The reality is that artificial general intelligence is probably a long way off, but targeted applications of machine learning (ML) will change the way that we live in years to come.

If you have used Siri or Alexa or Google Home or have had your spelling and grammar checked online or scrolled through social media, or watched a blockbuster movie recently then you are already a consumer of ML even if you didn't know it. At a recent conference, someone pointed out that Tesla is a software company building ML models on how people drive so that an ML algorithm can do it better. Personally, I welcome that. Although the best ML driver may not be as good as the best human, I can easily imagine a world where the average ML driver is significantly better than the average human.

In the media world, we have seen some revolutionary techniques change the way in which ML handles imagery. My favorite was invented in a pub by Ian Goodfellow and friends in 2014. Generative adversarial networks (GANs) is a technique where you train one ML engine called the discriminator to recognize something—faces, for example.[1] A second ML engine called the generator is then tasked with creating a picture of a face. If you join these two engines together in a game where the discriminator has to say whether or not the picture looks like a real face, then the two systems can iterate at high speed until the generator starts to make pictures that really look like faces.

We have similar systems in the real world. Let's replace the discriminator with a real-world organization—the police, for example. Now let's replace the generator with another real-world organization—a banknote counterfeiter, for example. It's easy to see that when the police spot a fake, the counterfeiters will improve their techniques and, most importantly, so will the police.

With an election taking place in the U.S. in 2020, there are worries that widespread availability of these GAN tools will result in lots of deep fake video clips that are circulated with the intention of affecting the outcome of the election. Whether or not this is the case, the techniques themselves cannot be uninvented, so we need to find good ways to improve the discrimination of trusted and untrusted content. In the document world, we continue to invent and reinvent more secure ways to sign documents in order to validate their authenticity. GAN technology might be the tipping point to standardize some video authenticity signatures. If there is someone out there who would like to lead a SMPTE Study Group on the topic, then you know how to find me to make it happen.

Enjoy this issue of the *Journal*.

Bruce Devlin
SVP and Authenticated Human

Reference

1. [Online]. Available: https://en.wikipedia.org/wiki/Generative_adversarial_network

UPCOMING SMPTE TECHNOLOGY COMMITTEE MEETINGS

1–4 June
Portland, OR

16–19 September
Geneva, Switzerland

7–10 December
Burbank, CA

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