The number of daily active users (DAU) of Pokemon Go dropped to just 5 million from its peak of 45 million DAU within a year of release.

ADVICE

Navigating Through the Hype that Surrounds Machine Learning

Machine learning (ML) is an amalgamation of several different fields, including mathematical optimization, computational statistics, artificial intelligence, knowledge discovery, and pattern recognition, among others. One would think only polymaths could become machine learning experts. And still, these days it seems everyone we meet (or know of) is a machine learning expert. How is that even possible?

Surprisingly though, the field is not a new one. We can trace its roots back to the 17th century when Thomas Bayes' widely influential work on Bayes' Theorem was published. More recently, Seppo Linnainmaa proposed the idea of backpropagation (the key ingredient of deep learning) in 1970. Then in 1986, it was further refined thanks to the work of Rumelhart, Hinton, and Williams. While the first neural network was developed in 1951, perceptrons in 1957, RNNs in 1982, and reinforcement

learning in 1989, deep learning is lovingly referred to as the “new electricity,” as though it were a brand new discipline. So, I believe it pertinent to know how to navigate the hype surrounding machine learning and deep learning, and cut right to the chaff.

First and foremost, for any new technology, it is vital to identify its strengths and weaknesses. Research papers might present results for only the best case in highly controlled scenarios, then draw conclusions for a more generic setting, which can thereby provide fodder for the hype. For example, even though deep learning methods have shown considerable improvements in the area of speech recognition and image processing, a similar inference can't be

drawn for the text mining problems. As a matter of fact, associating semantic meanings to text or predicting moving targets like flu still remain a challenge.

Second, identifying resources that can possibly act as bottlenecks is important. Many potent machine learning methods, like Bayesian probabilistic inference or neural networks, were developed during the 1960s. But due to their computational limitations were not applied to real applications until very recently. Similarly, reliance on large quantities of labeled data is another bottleneck in adapting new machine learning methods. In the case of deep-learning methods, the complicated task of feature engineering has been eliminated by

Mining reality from hype is a complicated process with no simple solution. What makes it alarming is when people give in to hype and draw faulty inferences.

2012

Google announced its first pair of smart glasses, Google Glass, which failed to achieve commercial success. The project was shuttered three years later.

end-to-end learning, but as a byproduct this has given prominence to an equally complex problem of hyperparameter optimization.

Finally, you should focus on understanding the underlying technical implementation rather than continuing to use new technology as though it were a black box. For example, decently complex multi-layered deep learning models can be built in Keras with as little as seven lines of code, which greatly reduces the barrier to entry. However, it is really important to know how to troubleshoot and improve the model's performance. Gaining this knowledge will be the most challenging part of adapting the new technology and will naturally help you cut through the hype.

In conclusion, mining reality from hype is a complicated process with no simple solution. What makes it alarming is when people give in to hype and draw faulty inferences. In the context of machine learning, there has been an increasing interest in exploring new methods that can assist law enforcement agencies with predictive policing, judiciary bodies with sentencing criminals, and the intelligence community with AI assistance. However, the limitation that gets omitted during these applications is the inherent bias in machine learning models that might come from a biased training set, incorrectly optimized hyperparameters, or the lack of explainability. Needless to say, these questions involve ethical issues that might get violated when people start believing in the hype.

What do you think? Is the recent interest in machine learning hype or reality? Let us know your views.

—Parang Saraf

MILESTONES

The Evolution of Augmented Reality

Hype is an inevitable subject when discussing technology. With sectors like life sciences and agtech currently underhyped, areas like artificial intelligence and virtual reality have been the “next big things” for a while. Here, we briefly explore the evolution of one such overhyped technology, augmented reality.

1962 Morton Heilig's Sensorama was a simulator with visuals, vibrations, sound, and smell. The mechanical device is one of earliest examples of multi-sensory technology, which featured stereoscopic color display, stereo-sound system, etc.

1975 Myron Krueger established an artificial reality laboratory, with the sole concept of surrounding users with an artificial reality that responded to their motions and gestures. Projectors and video cameras, along with a few special purpose hardware, were used to create the interactive environment.

1980 The first wearable computer, EyeTap, was developed by Steve Mann. EyeTap could be worn in front of the eyes, acting as a camera to record scenes available to the eye. Acting as a monitor, the user's eye could intake and augment any image the user saw and overlay it with computer-generated data.

2013 Google announced a brand of smart glasses called Google Glass, which connected to the internet via Bluetooth and allowed users to communicate with the internet via natural language voice commands.

2017 Apple announced ARKit, a software framework that transforms existing mobile devices and their cameras into AR platforms. Google released a similar framework called ARCore, which also aims to imbue Android devices with AR capabilities.

—Alok Pandey

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DOI: 10.1145/3292416
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