How is machine learning used today?

Actually, there are plenty of places in which machine learning is used today. Many of these are behind the scenes, however you may be surprised to know that a lot of them are also something that you use every single day. Perhaps the one that you use the most is in your personal assistant — that’s right, the likes of Siri and Google Now use machine learning, largely to better understand speech patterns.

With so many millions of people using Siri, the system is able to seriously advance in how it treats languages, accents, and so on. Of course, Siri isn’t the only consumer application of machine learning. Another use is is in banking, such as fraud detection.

For example, machine learning algorithms can track spending patterns, determining which patterns are more likely to be fraudulent based on past fraudulent activity.

In fact, even your email might be using machine learning. For example, spam emails are a problem, and they have evolved over time. Email systems use machine learning to track spam email patterns and how spam emails change, then putting them in your spam folder based on those changes.

Personalizing customer service. The potential to improve customer service while lowering costs makes this one of the most exciting areas of opportunity. By combining historical customer service data, natural language processing, and algorithms that continuously learn from interactions, customers can ask questions and get high-quality answers. In fact, 44% of U.S. consumers already prefer chatbots to humans for customer relations. Customer service representatives can step in to handle exceptions, with the algorithms looking over their shoulders to learn what to do next time around.

Improving customer loyalty and retention. Companies can mine customer actions, transactions, and social sentiment data to identify customers who are at high risk of leaving. Combined with profitability data, this allows organizations to optimize “next best action” strategies and personalize the end-to-end customer experience. For example, young adults coming off of their parents’ mobile phone plans often move to other carriers. Telco’s can use machine learning to anticipate this behavior and make customized offers, based on the individual’s usage patterns, before they defect to competitors.

Hiring the right people. Corporate job openings pull in about 250 résumés apiece, and over half of surveyed recruiters say shortlisting qualified candidates is the most difficult part of their job. Software quickly sifts through thousands of job applications and shortlists candidates who have the credentials that are most likely to achieve success at the company. Care must be taken not to reinforce any human biases implicit in prior hiring. But software can also combat human bias by automatically flagging biased language in job descriptions, detecting highly qualified candidates who might have been overlooked because they didn’t fit traditional expectations.

Automating finance. AI can expedite “exception handling” in many financial processes. For example, when a payment is received without an order number, a person must sort out which order the payment corresponds to, and determine what to do with any excess or shortfall. By monitoring existing processes and learning to recognize different situations, AI significantly increases the number of invoices that can be matched automatically. This lets organizations reduce the amount of work outsourced to service centers and frees up finance staff to focus on strategic tasks.

Measuring brand exposure. Automated programs can recognize products, people, logos, and more. For example, advanced image recognition can be used to track the position of brand logos that appear in video footage of a sporting event, such as a basketball game. Corporate sponsors get to see the return on investment of their sponsorship investment with detailed analyses, including the quantity, duration, and placement of corporate logos.

Detecting fraud. The typical organization loses 5% of revenues each year to fraud. By building models based on historical transactions, social network information, and other external sources of data, machine learning algorithms can use pattern recognition to spot anomalies, exceptions, and outliers. This helps detect and prevent fraudulent transactions in real time, even for previously unknown types of fraud. For example, banks can use historical transaction data to build algorithms that recognize fraudulent behavior. They can also discover suspicious patterns of payments and transfers between networks of individuals with overlapping corporate connections. This type of “algorithmic security” is applicable to a wide range of situations, such as cybersecurity and tax evasion.

Predictive maintenance. Machine learning makes it possible to detect anomalies in the temperature of a train axle that indicate that it will freeze up in the next few hours. Instead of hundreds of passengers being stranded in the countryside, waiting for an expensive repair, the train can be diverted to maintenance before it fails, and passengers transferred to a different train.

Smoother supply chains. Machine learning enables contextual analysis of logistics data to predict and mitigate supply chain risks. Algorithms can sift through public social data and news feeds in multiple languages to detect, for example, a fire in a remote factory that supplies vital ball bearings that are used in a car transmission.

Other areas where machine intelligence could soon be commonly used include:

Career planning. Recommendations could help employees choose career paths that lead to high performance, satisfaction, and retention. If a person with an engineering degree wishes to run the division someday, what additional education and work experience should they obtain, and in what order?

Drone- and satellite-based asset management. Drones equipped with cameras can perform regular external inspections of commercial structures, like bridges or airplanes, with the images automatically analyzed to detect any new cracks or changes to surfaces.

Retail shelf analysis. A sports drink company could use machine intelligence, coupled with machine vision, to see whether its in-store displays are at the promised location, the shelves are properly stocked with products, and the product labels are facing outward.

Machine learning enables a company to reimagine end-to-end business processes with digital intelligence. The potential is enormous. That’s why software vendors are investing heavily in adding AI to their existing applications and in creating net-new solutions.

Data Security

Malware is a huge — and growing — problem. In 2014, Kaspersky Lab said it had detected 325,000 new malware files every day. But, institutional intelligence company Deep Instinct says that each piece of new malware tends to have almost the same code as previous versions — only between 2 and 10% of the files change from iteration to iteration. Their learning model has no problem with the 2–10% variations, and can predict which files are malware with great accuracy. In other situations, machine learning algorithms can look for patterns in how data in the cloud is accessed, and report anomalies that could predict security breaches.

Personal Security

If you’ve flown on an airplane or attended a big public event lately, you almost certainly had to wait in long security screening lines. But machine learning is proving that it can be an asset to help eliminate false alarms and spot things human screeners might miss in security screenings at airports, stadiums, concerts, and other venues. That can speed up the process significantly and ensure safer events.

Financial Trading

Many people are eager to be able to predict what the stock markets will do on any given day — for obvious reasons. But machine learning algorithms are getting closer all the time. Many prestigious trading firms use proprietary systems to predict and execute trades at high speeds and high volume. Many of these rely on probabilities, but even a trade with a relatively low probability, at a high enough volume or speed, can turn huge profits for the firms. And humans can’t possibly compete with machines when it comes to consuming vast quantities of data or the speed with which they can execute a trade.

Source: Shutterstock

Healthcare

Machine learning algorithms can process more information and spot more patterns than their human counterparts. One study used computer assisted diagnosis (CAD) when to review the early mammography scans of women who later developed breast cancer, and the computer spotted 52% of the cancers as much as a year before the women were officially diagnosed. Additionally, machine learning can be used to understand risk factors for disease in large populations. The company Medecision developed an algorithm that was able to identify eight variables to predict avoidable hospitalizations in diabetes patients.

Marketing Personalization

The more you can understand about your customers, the better you can serve them, and the more you will sell. That’s the foundation behind marketing personalisation. Perhaps you’ve had the experience in which you visit an online store and look at a product but don’t buy it — and then see digital ads across the web for that exact product for days afterward. That kind of marketing personalization is just the tip of the iceberg. Companies can personalize which emails a customer receives, which direct mailings or coupons, which offers they see, which products show up as “recommended” and so on, all designed to lead the consumer more reliably towards a sale.

Fraud Detection

Machine learning is getting better and better at spotting potential cases of fraud across many different fields. PayPal, for example, is using machine learning to fight money laundering. The company has tools that compare millions of transactions and can precisely distinguish between legitimate and fraudulent transactions between buyers and sellers.

Recommendations

You’re probably familiar with this use if you use services like Amazon or Netflix. Intelligent machine learning algorithms analyze your activity and compare it to the millions of other users to determine what you might like to buy or binge watch next. These recommendations are getting smarter all the time, recognizing, for example, that you might purchase certain things as gifts (and not want the item yourself) or that there might be different family members who have different TV preferences.

Online Search

Perhaps the most famous use of machine learning, Google and its competitors are constantly improving what the search engine understands. Every time you execute a search on Google, the program watches how you respond to the results. If you click the top result and stay on that web page, we can assume you got the information you were looking for and the search was a success. If, on the other hand, you click to the second page of results, or type in a new search string without clicking any of the results, we can surmise that the search engine didn’t serve up the results you wanted — and the program can learn from that mistake to deliver a better result in the future.

Natural Language Processing (NLP)

NLP is being used in all sorts of exciting applications across disciplines. Machine learning algorithms with natural language can stand in for customer service agents and more quickly route customers to the information they need. It’s being used to translate obscure legalese in contracts into plain language and help attorneys sort through large volumes of information to prepare for a case.

Smart Cars

IBM recently surveyed top auto executives, and 74% expected that we would see smart cars on the road by 2025. A smart car would not only integrate into the Internet of Things.

CONCLUSIONS

Machine learning is set to be a big part of how we use technology going forward, and how technology can help us. From Siri to US Bank, machine learning is becoming increasingly pervasive,

and that’s only likely to continue.