SmartBridge Externship Program

On

Artificial Intelligence and Machine learning

Assignment – 1

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Understand and list down 20 use-cases of Artificial Intelligence / Machine Learning.

Machine Learning is naturally a subset of AI. It provides the statistical methods and algorithms and enables the machines/computers to learn automatically from their previous experiences and data and allows the program to change its behavior accordingly.

Machine Learning provides many different techniques and algorithms to make the computer learn. Different use cases of AI and ML are:

1.Data Security

Malware is a huge and growing problem. MLs 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.

2. Personal Security

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.

3.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.

4.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 developed an algorithm that was able to identify eight variables to predict avoidable hospitalizations in diabetes patients.

5.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.

6.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.

7.Recommendations

You're probably familiar with this use if you use services like Amazon or Netflix. Intelligent machine learning algorithms analyse 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.

8.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.

9.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.

10.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, but also learn about its owner and its environment. It might adjust the internal settings- temperature, audio, seat position, etc. — automatically based on the driver, report and even fix problems itself, drive itself, and offer real time advice about traffic and road conditions.

11.Image analysis for medical diagnostics

However well trained and experience a physicist is, they are likely to end up missing something or the other in medical diagnostics. Fortunately, with the help of image analysis, doctors can get help from technology to analyse many of the medical images such as MRIs, X-rays, and CT scans. Besides, the technology can also provide feedback on what the human eyes miss out on.

12.Automating the administrative tasks

Healthcare institutions are a big hub for data. On a daily basis, many patients come in and go out. Even though many don't need follow-ups, it is the responsibility of the healthcare workers to keep a record of patients' medical data. Therefore, they use AI to automate administrative tasks. It is expected that by implying AI in automating administrative tasks, healthcare institutions can save up to US$18 billion. Machines can also help doctors and nurses save time on labor-dense works.

13.AI Application in Manufacturing

Companies use AI-based robotics combined with a human workforce to execute manufacturing and supply chain tasks. AI-powered robotics in manufacturing has generated proven results in the proper handling of materials, test performances, and packing finished products. The use of artificial intelligence in the manufacturing of cars makes the manufacturing process swift as robots are given the responsibility to use their deep learning programs to determine which parts to pick and how to pick.

14.Advanced-Data Analytics

The manufacturing sector has been successful in using AI for its advanced data analytics. Digital transformation has led to a supply of multiple sets of large-scale real-time data that are used for in-depth insights to predict current market trends. The combination of data with advanced analytics has provided tremendous help in risk management, data visualization, supply chain management also rapid decision-making process efficiently and effectively.

15.Robotic Process Automation

Robotic Process Automation or RPA software has the functionalities to manage the backend duties of the organization effectively without any human intervention. It helps the employees to focus on other duties to enhance productivity. RPA manages high-volume repetitious tasks with multiple complex calculations and records maintenance accurately. Implementing RPA software in several systems of the manufacturing industries can help to reduce time and improve workflow against competitors.

16.Cybersecurity

The Defence Advanced Research Projects Agency (DARPA) organized a competition in 2016 called as Cyber Grand Challenge to find automatic defence systems that would automatically identify the flaws of defence-related software. The results of the competition demonstrated that the AI-based cyber tools have the ability to play offense and defence in a simultaneous manner.

17.Virtual Assistance

One of the biggest contributions of artificial intelligence is conversational AI. It helps the telecom companies to control the massive customer support traffic, reducing call time wait for

customers, maintaining and troubleshooting problems, and also helping in installation and set up of other projects. According to reports, virtual assistants can automate calls so efficiently that by 2022, telecom sectors are estimated to cut costs by US$ 8 billion, annually.

18.Content Personalization

Don’t you like it when popular OTT platforms like Netflix, Hulu, and Prime show you the kind of shows and movies that interest you? That’s the work of artificial intelligence. Content streaming sites have perfected their streaming recommendations according to different tastes and preferences for people of all locations. These companies use machine learning and AI algorithms to analyse user behaviour, in terms of what genre of content users are mostly streaming. AI uses these data insights to create a highly personalized experience for every user.

19.Subtitle Creation

With vernacular media becoming mainstream, production firms are making sure that their content is suitable for audiences from various regions. To make foreign content comprehensible, providing accurate multilingual subtitles is crucial, especially for video streaming platforms. Manually writing subtitles for each movie and show is stressful and time-consuming. In addition, the cost of hiring employees who can understand and translate different languages is cost-invasive. As a solution to these challenges, the media and entertainment industry is using AI-powered technologies like NLP and natural language production.

20.Method for Pricing

It is one of the most effective AI applications in the retail industry. One of the most difficult challenges for retailers is product pricing. They should know the market price of the product before pricing it. Artificial intelligence applications for retail can help retailers determine the ideal price for a product that will entice customers. AI models in retail stores ensure profitability in terms of acceptable pricing without causing you to lose customers.